Leadership for team learning

LEADERSHIP FOR TEAM LEARNING

engaging university teachers in change

mieke koeslag-kreunen

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Mieke Geeske Margriet Koeslag-Kreunen

Supervisors

Prof. Dr. Wim H. Gijselaers
Prof. Dr. Piet Van den Bossche, University of Antwerp, Belgium/Maastricht University, The Netherlands
Dr. Marcel R. Van der Klink

Assessment committee

Prof. Dr. Mien S. R. Segers (chair)
Em. Prof. Dr. Joseph W. M. Kessels, Open University, The Netherlands
Prof. Dr. Amy C. Edmondson, Harvard University, USA
Dr. Hannes Günther

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Mieke
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1 GENERAL INTRODUCTION

INTRODUCTION

Cooperation among university teachers sounded like a good idea. Two professional schools for undergraduate education had just started evaluating their programs. They had both finished implementing an educational reform hierarchically led by a project team. The teachers observed the reform as a top-down strategy that disrupted their routines, despite collaborative professional development and design activities. They felt no connection to the new program they were obliged to integrate into their practices. They felt insecure as they noticed their routines failed to meet the newly set pedagogies, didactics, and assessment forms. As a result, it took several years for them to overcome their resistance and change their habits.

During the program evaluation, their boards announced that the two schools needed to merge to deal with student population decrease. Integration of their brand-new programs and downsizing from four to one location was inevitable. A new call for reform was born. Yet, the teachers were tired of the continuous pressure for educational change and vigorously defended their freshly developed programs. All of a sudden, the top-down implemented program – which they had initially resisted so much – was the best possible educational scenario they could wish for. They had constructed new routines and were now determined to keep those.

The two educational program leaders came together to discuss the merger and their strategy for the upcoming educational change. They felt the chaos and uncertainty among their teachers and superiors. The two educational leaders saw themselves confronted with an unstructured and difficult task. However – informed by literature and their experiences with the former reform – they were certain about one thing: they connected the teachers in small multidisciplinary teams to jointly construct the upcoming innovation, with undergraduates and field professionals as daily advisors. Cooperation among teaching staff sounded like a great idea because it offered a structure to share and integrate diverse expertise, backgrounds, and ideas that would eventually result in a new curriculum. After a few months, the teachers were all a member of one or more teams. Each team received a prescribed task to develop a new 10-week educational course based on recent insights on their subjects, learning, and assessment forms for

undergraduates, and up-to-date regional, national, and international professional demands.

Teachers experienced a new autonomy in this bottom-up and team-based development process. They collaboratively worked towards new practices. Their resistance to change was substituted by a joint journey to build a shared program. But the two educational leaders were not yet satisfied. The output quality was far beneath their expectations and aims. In their eyes, it took the teacher teams too many meetings to achieve poor-quality results, if any. They saw teachers exchange practices but not compare, change, or integrate them into a current overall theme. The teachers simply replaced the titles of their existing courses with new ones. Assessments were constructed independently, ending in a set of isolated assignments and separate questions per subject. Existing learning goals were consolidated and simply merged into a longer list, instead of being analyzed, updated, and integrated. Lessons were marginally adapted independently but were not interrelated or modernized. When a conflict occurred, the teachers ask their educational leaders to solve the problem outside their team. They did not take decisions when different ideas were proposed, but simply asked their leaders to take that responsibility. What started as a good idea did not automatically result in success. The teams had invested a great deal of time in solely sharing ideas without achieving any results towards the desired new educational courses. The two educational leaders wondered what they could do to help their teams engage in change and build a new educational program together.

This story exemplifies an initiative to connect professionals in teams to work on a complex task. Teamwork as a way of organizing work and finding new solutions has become more and more common in many professions (Kozlowski & Ilgen, 2006; Salas, Goodwin, & Burke, 2009). Throughout this dissertation, teams are defined as:

> *"A collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems" (Cohen & Bailey, 1997, p. 241).*

A team approach to work is used especially in contexts where professionals have specialized knowledge, exclusive skills, and diverse attitudes that need to be combined to deal with increased amounts of information, rapidly changing technologies, and unpredictable requests for change (Kozlowski & Ilgen, 2006; Salas et al., 2009). Connecting these professionals in teams offers opportunities to share, discuss, and integrate individuals' unique expertise, ideas, and perspectives at a team level (Kozlowski & Ilgen, 2006). We refer to these team processes as team learning behavior that builds shared cognitions and solutions for issues at hand (Van den

Bossche, Gijselaers, Segers, & Kirschner, 2006). Senge (1990) was one of the first who argued that these processes allow organizations to successfully adapt to rapid changes in society:

> *"Team learning is vital because teams, not individuals, are the fundamental learning unit in modern organizations. This is where the rubber meets the road; unless teams can learn, the organization cannot learn" (Senge, 1990, p. 10).*

Ever since, research across professions has shown that team learning behavior helps teams bring about advanced knowledge and products (Mathieu, Maynard, Rapp, & Gilson, 2008). This is a fundamental reason why teams are omnipresent in today's organizations.

However, the story also illustrates that simply putting professionals together to solve complex problems does not automatically mean they will engage in team learning behavior. Despite having a prescribed task to develop new courses, the teachers in the example above only applied new titles to existing courses and did not produce modernized solutions. They seemed to work collaboratively, but in fact worked independently on constructing assessments, learning goals, and lessons. They shared ideas but did not build upon each other's ideas or act upon differences, which resulted in superficial changes. The team leaders were not satisfied with the outcomes but did not know how to intervene effectively.

Such problems are found everywhere, not only in teams of university teachers. They are found in studies on team learning behavior across many professional fields. Edmondson, Bohmer, and Pisano (2001) observed that members of surgery teams do not contribute to discussions if they sense a lack of mutual trust and respect due to power differences. Lee, Gillespie, Mann, and Wearing (2010) revealed that engineers do not disclose their unique information at a team level if they perceive an absence of confidence in the team capability and leadership. McKeown (2012) showed that teams of business managers do not participate in knowledge sharing, discussions, or reflective dialogues if their team leaders set goals, decide on activities, and make decisions for them.

At the same time, these studies have shown that team leadership behavior plays a key role in supporting teams to engage in team learning behavior. For instance, team leaders can motivate teams to learn together by fostering a safe climate for teams to share ideas (Edmondson et al., 2001), by creating enthusiasm for team members to rely on and exchange knowledge with each other (Lee et al., 2010), and by stimulating team members to participate in decision-making (McKeown, 2012).

However, this type of team research is limited in educational contexts (Vangrieken, Dochy, Raes, & Kyndt, 2015), rarely relates multiple types of team leadership behavior to team learning behavior (Zaccaro, Ely, & Shuffler, 2008), largely neglects the influences of the specific team context (Edmondson, Dillon, & Roloff,

2007), and generally only focuses on team leadership behavior without paying attention to underlying cognitions that guide that behavior (Day, Harrison, & Halpin, 2009). This dissertation therefore aims to understand how team leadership behavior can stimulate team learning behavior in the context of university teacher teams. In doing so, we build on educational, leadership, and team science.

STUDYING LEARNING BEHAVIOR IN THE CONTEXT OF UNIVERSITY TEACHER TEAMS

University teachers are defined as professional educators who work at higher education institutions and educate undergraduates, graduates, or post-graduates for a specific profession (Houle, Cyphert, & Boggs, 1987). Their main focus is on teaching for professional practice and on advancing the knowledge and practice of professions through practice-based research and development (Houle et al., 1987). Many different terms are used for staff in higher education, such as academic teachers, academic teaching staff, teaching-focused academics, tutors, lecturers, and faculty members. We use the term university teachers to emphasize their task to teach for the professions (in contrast to academic research staff).

Chapters 2, 4, and 5 present studies conducted in the context of higher professional education (chapter 3 contains a multidisciplinary study). The term higher professional educational institutions refers to *hogescholen* in the Netherlands. These institutions offer undergraduate tracks, professional bachelor's and master's degrees and post-graduate programs for specific professions, similar to, for instance (university) (professional) schools in the US, *Fachhochschulen* in Germany, and polytechnics (institutions for engineering and technology) or new universities in the UK (Huisman & Kaiser, 2001). This dissertation uses higher education and university interchangeably.

This dissertation argues that university teacher teams need to engage in learning behavior to work towards educational change, since relying on individual expertise alone is no longer adequate. A team approach offers opportunities for professionals to integrate their unique expertise (Salas et al., 2009). This can also enable university teachers to develop new educational practices to fit current job demands (Kezar, 2011) or new programs for newly emerging jobs (Lehtinen, Hakkarainen, & Palonen, 2014). Multidisciplinary expertise is needed to construct programs for learning how to work in an interprofessional context (Stalmeijer, Gijselaers, Wolfhagen, Harendza, & Scherpbier, 2007). Specific and generic skills need to be integrated in curricula to increase the employability of young professionals (Fallows & Stevens, 2000). We argue that to develop and implement such educational change, university teachers need to engage in team learning behavior to integrate

their individual knowledge, unique expertise, and fresh ideas in teams, as this will allow them to deal with the emerging task complexity (Kozlowski & Ilgen, 2006).

To be clear, we do not characterize all collaborative practice among university teachers as team work. Despite collaboration among university teachers has increased, Roxå and Mårtensson (2015) indicated that not all collaborative forms necessarily result in educational change. Roxå and Mårtensson (2015) argued that change can only be achieved when collaborating teachers experience mutual trust and shared responsibility for educational development and when they share knowledge and build on each other's ideas:

> *"Due to the level of trust, the individual member is offered freedom during his or her engagement in the practice. On the other hand, the experience of a shared responsibility allows for members to interfere and even question actions and interpretations made by the other members. The overall experience is that 'we are all in this together'." (Roxå & Mårtensson, 2015, p. 199)*

Smith (2000) argued similarly and claimed that not all interactions between teachers can be defined as teamwork. He argued that the more interdependent teachers are in their task, the higher the chance of "strong interactions" that allow teachers to develop new knowledge together. Smith (2000, p. 48) used the framework (presented by Figure 1.1) developed by Little (1990) to illustrate a continuum of interdependence and interactions in teacher collaboration:

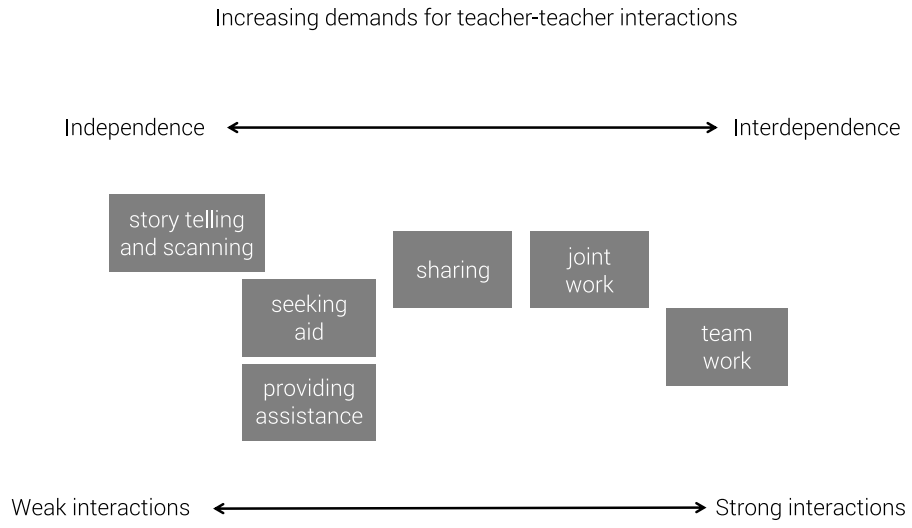

Figure 1.1 Teacher-teacher interaction continuum, adapted from Little (1990, p. 513)

This figure demonstrates how teacher teamwork is situated at the end of the continuum, with high levels of interdependence and interaction compared to other

collaborative forms. Also in other domains, task interdependence and shared responsibility are characteristics that distinguish teams from other collaborative forms (Katzenbach & Smith, 1993; Salas, Burke, & Cannon-Bowers, 2000). As such, teamwork may allow teachers to move interactions from superficial storytelling or the mere exchanges of ideas towards deeper interaction levels, such as questioning practices, discussing differences, and seeking alternatives (Little, 1990; Smith, 2000). Paavola, Lipponen, and Hakkarainen (2004) argued that these deeper levels of collaborative learning behaviors are needed to work towards change. Without them, the output of interactions is limited to only the awareness of each other's knowledge (Paavola et al., 2004). So, this dissertation applies the team definition given by Cohen and Bailey (1997) and studies university teacher teams that need to work towards educational change by engaging in team learning behavior. The team's purpose can be specified as:

> *The common purpose for a team is the design or implementation of a curriculum innovation in the form of (re)design of a course or entire curriculum and/or the improvement of teaching. A pair of teachers working together and supporting each other is not considered a team (Gast, Schildkamp, & Van der Veen, 2017, p. 737).*

To date, surprisingly little is known about learning behavior in university teacher teams. Empirical studies on collaborating teachers are mostly conducted outside higher education (i.e., mainly in primary or secondary education) and predominantly examine other collaborative forms (Brouwer, Brekelmans, Nieuwenhuis, & Simons, 2012; Gast et al., 2017; Vangrieken et al., 2015). Vangrieken et al. (2015) reviewed studies on teacher collaboration across educational contexts, and concluded that the collaborative learning processes of teachers are generally superficial. They referred to Havnes (2009) to illustrate that teachers' collaborative learning processes often seem restricted to superficial communication:

> *These [interaction processes] range from preserving individualism – focusing on individual teacher responsibility and autonomy, over coordination – coordinating responsibilities and tasks without discussion of the substance of teaching, cooperation – establishment of a common ground for joint enterprise through focusing on the content and process of classroom activity, and finally sharing –sharing and clarification of pedagogical motives that direct the way the teaching and learning is being structured. (Vangrieken et al., 2015, p. 26).*

Deeper collaborative learning processes appeared to rarely occur. Rather, collaboration was restricted to practical issues, and sharing ideas, planning, teaching content, and teaching activities. Vangrieken et al. (2015) concluded that teachers rarely discussed, reflected upon, and questioned matters such as didactics, daily teaching problems, personal and colleague performance, and

critical analyses of teaching. Yet these deeper levels are the processes required to work towards change (Paavola et al., 2004). Moreover, most of the research on the collaborative learning processes of teachers does not examine learning behavior in teacher teams but in other collaboration forms, such as communities of practice (e.g., Little, 2002), networks (e.g., Van Waes, Van den Bossche, Moolenaar, De Maeyer, & Van Petegem, 2015), learning communities (e.g., Furco & Moely, 2012), and teacher teams that do not meet the team definition of this dissertation. In such forms, teacher collaboration is mainly based on a shared interest without holding teachers accountable for outcomes (Brouwer et al., 2012).

Nevertheless, even the limited research that is available on teacher teams has found that, despite task interdependency and shared outcome responsibility, "strong interactions" or deeper levels of team collaborative learning processes do not occur automatically. Stalmeijer et al. (2007) and Bron, Endedijk, Van Veelen, & Veldkamp (2018) are two of the few available studies that look at learning behavior in university teacher teams. They showed that university teachers are able to engage in team learning behavior but that this does not automatically lead to successful educational change. This is due to aspects such as a lack of trust (Stalmeijer et al., 2007) or whether the teams aimed to either sustain or innovate courses (Bron et al., 2018). These preliminary results indicate that team learning behavior needs to be supported to engage university teachers in change.

We argue that universities are at risk if their teachers are not encouraged to engage in team learning behavior and move beyond their habits. Barber, Donnelly, and Rizvi (2013), Christensen and Eyring (2012) and Fullan and Scott (2009) claimed that if higher educational institutions do not rigorously change their educational programs they will lose their traditional status and exclusive position to more attractive, flexible, advanced, differentiated, work-based, or less-expensive forms of higher education. Higher education runs a risk if university teacher teams do not work towards educational change by engaging in team learning behavior (Barber et al., 2013; Christensen & Eyring, 2012; Fullan & Scott, 2009). Higher educational institutions need to respond to increasing demands on young professionals' skills in the labor market, emerging new professions, novel learning technologies, decreasing funds, and a more diverse student population (Christensen & Eyring, 2012). Subsequently, Barber et al. (2013) claimed that higher educational institutions are urged to bring about new pedagogies, didactics, programs, and professional degrees to maintain their unique status. Accordingly, we argue that support will inevitably be needed to facilitate the learning behavior of university teacher teams.

Building on team research to study university teacher team learning behavior can also benefit other professional organizations, since they face similar problems. One of the most prominent ones is the rapidly changing technology, increasing competition, growing budgetary strains, and intensifying globalization (e.g.,

Barber et al., 2013). Such developments challenge conventional methods and outcomes across professional organizations (Salas et al., 2009). Developing these changes typically involves: (1) unpredictable outcomes (e.g., programs for unknown future jobs; Lehtinen et al. (2014), (2) complex working methods (e.g., multidisciplinary expertise for interprofessional programs; Stalmeijer et al.2007), and (3) novel elements (e.g., integration of employability skills in curricula; Fallows & Steven, 2000). These task characteristics provide analogous reasons for various organizations to establish teams that bring about change by engaging in team learning behavior (Salas et al., 2009). Therefore, an increased understanding about supporting team learning behavior is beneficial for more organizations than those in higher education alone.

THE CONCEPT OF TEAM LEARNING BEHAVIOR

We build on general team research to define the concept of team learning behavior, since consistent concepts of teacher team learning behavior appear to be absent (Gast et al., 2017; Vangrieken et al., 2015). Over almost three decades, team research has strongly demonstrated the importance of team learning. Edmondson et al. (2007) discerned three team learning perspectives: (a) team learning as performance improvement (e.g., changed knowledge and skills; Ellis et al., 2003), (b) team learning as task mastery (e.g., the ability to coordinate team members' knowledge to accomplish tasks; Wilson, Goodman, & Cronin, 2007), and (c) team learning as a process (e.g., sharing and discussing knowledge at a team level; Dechant, Marsick, & Kasl, 1993). This dissertation conceptualizes team learning as a process, and makes a clear distinction between team processes and team outcomes. Input-Process-Output models (e.g., Gladstein, 1984) – widely used to analyze teams and team performance – show that inputs (e.g., composition and leadership) influence team processes (e.g., team learning behavior), and in turn lead to team outcomes (e.g., performance and viability) (Hackman, 1987). In this respect, performance improvement and task mastery are team learning perspectives that represent outcomes of team processes, because they develop from behavioral learning processes within the team (Decuyper, Dochy, & Van den Bossche, 2010; Kozlowski & Ilgen, 2006). Hence, we focus on team learning as behavioral learning processes that take place at a team level.

Decuyper et al. 's (2010) multidisciplinary review identified six team learning behaviors that are significant for team performance: (a) sharing, (b) co-construction, (c) constructive conflict, (d) reflexivity, (e) activity, and (f) boundary crossing. Sharing is about communicating ideas, knowledge, and opinions at a team level (Faraj & Sproull, 2000). Co-construction concerns building on and modifying what is shared (Van den Bossche et al., 2006). Constructive conflicts occur when team members act upon differences, negotiate opposed ideas, and integrate those into

an agreement, or an agreement to disagree (Van den Bossche et al., 2006). Reflexivity involves collectively reflecting on processes and progress (West, 1996). Activity means trying-out solutions (Decuyper et al., 2010). Boundary crossing takes place when external information, views, and ideas are sought or given through interaction (Kasl, Marsick, & Dechant, 1997). These learning processes at a team level enable teams to improve existing knowledge, develop new techniques, try-out different approaches, build innovative products in a short time (Hoegl, Parboteeah, & Gemuenden, 2003; Van den Bossche et al., 2006). As such, these team learning behaviors exceed the sum of individual learning (Argote, 1993; Marks & Louis, 1999). Van den Bossche et al. (2006) showed that learning behavior at a team level builds shared cognitions that enable teams to modify ideas, change protocols, and develop new knowledge together. In sum, team learning behaviors are collective discourse activities that members jointly undertake to yield new insight into a problem, detect misunderstandings, question routines, and build shared meanings (Barron, 2003; Edmondson et al., 2007). As a result, team learning behavior is found to be a key driver for team performance, explaining their increased presence across professions (Kozlowski & Ilgen, 2006; Mathieu et al., 2008).

STUDYING TEAM LEADERSHIP BEHAVIOR IN HIGHER EDUCATION

Across disciplines, research shows that team members are reluctant to engage in team learning behavior (Edmondson et al., 2001; Lee et al., 2010; McKeown, 2012). For example, university teachers put themselves at risk if they express opposing ideas (Roxå & Mårtensson, 2015). One of the most promising factors to support team learning behavior is team leadership behavior. The meta-analysis of Burke et al. (2006) suggested that team leadership behavior explained no less than one third of the team learning variance. Furco and Moely (2012) suggested that leadership helps university teachers in sharing personal or opposed ideas with one another because it can bring structure and encouragement. Bucic, Robinson, and Ramburuth (2010) contributed to this suggestion by revealing that team leaders can encourage university teacher team learning by both structuring the task and challenging teams to share ideas. In addition, Gast et al.'s (2017) review on teamwork for professional development identified that team leadership behavior supports teamwork through both leaders and members who simultaneously facilitate communication and progress. We argue that such team leadership behavior is needed because team learning behavior does not just happen. Team leadership behavior may support team learning behavior by moving teachers beyond sharing ideas (Bron et al., 2018), expressing the benefits of discussing opposing ideas (Roxå & Mårtensson, 2009), stimulating teachers to overcome natural habits of

working solitarily (Cox, 2004), and recognizing and appreciating new ideas (Furco & Moely, 2012).

However, there is no empirical specification on what kind of team leadership behaviors support university teacher team learning behavior (Gast et al., 2017). Very few assumptions on leadership in higher education have been empirically tested (Bryman, 2007; Kezar & Holcombe, 2017), a variety of inconsistent concepts and conditions are used (Evans, Homer, & Rayner, 2013; Kezar & Holcombe, 2017; Van Ameijde, Nelson, Billsberry, & Van Meurs, 2009), and a team perspective as defined earlier is largely missing (Gast et al., 2017). What can be said about the current literature on leadership in higher education is that it seems to seek a balance between providing just enough freedom and structure for university teachers. In general, this appears to be fueled by the changing role of higher education (Bolden, Petrov, & Gosling, 2008; Juntrasook, 2014; Youngs, 2017):

> *As a result [of increased competition and society's expectations], higher education institutions are no longer the protected entities whose legitimacy is taken for granted, but instead are expected to face the complexity of balancing the need to operate according to market pressures, teach an increased number of students despite diminishing financial means while struggling to maintain traditional academic and educational principles of quality.*
>
> *The mechanisms which many higher education institutions have implemented to deal with these pressures seem to have created an interesting paradox. The introduction of procedures around performance measurement, quality control, and audit aimed at improving the effectiveness and accountability of higher education institutions have at the same time contributed to the creation of additional bureaucratic layers of control which have often been experienced as inhibiting organizational effectiveness and responsiveness (Van Ameijde et al., 2009, p. 764).*

This quote illustrates how changes in society can create complex challenges for higher education that can cause tension between staff and management, and between creativity and control (Bolden et al., 2008; Juntrasook, 2014; Youngs, 2017). As a consequence, current literature on higher education leadership seems to seek a combination of multiple types of leadership behavior. For instance, Van Ameijde (2009) suggested a combination of formal (or vertical) and shared leadership in higher education to address the unique tension between staff and management. Trevelyan (2001) concluded that job satisfaction requires university leaders who provide an optimal balance between low direction (freedom) and high involvement (advice).

Empirical insights on higher educational leadership conceptualizations such as these are scarce, but seem promising for supporting team learning behavior. For example, formal leaders can create a learning environment to support learning

processes for university teachers (Bui & Baruch, 2012), and shared leadership can foster social interactions and dialogue to support collective learning in university project teams (Jones, Harvey, Lefoe, & Ryland, 2014). However, Kezar and Holcombe's (2017) review concluded that there are few empirical studies available on outcomes and conditions of shared leadership in higher education, and that literature uses many different theoretical definitions and detects various appearances in practice. Bryman (2007) concluded similarly for formal (or vertical) leadership in his summary of literature on effective leadership in higher education. He specified that in this context, fostering a collegial atmosphere and combining task and relational leadership are the most important behaviors, but also stated that this has not been empirically tested. Based on similar arguments, Evans et al. (2013) recommended that research is needed to learn more about when leadership in higher education is effective for university teachers. This is based on their finding that the university teachers in their sample did not feel supported by their leaders, and they detected uncertainty about how to combine vertical and shared leadership sources in practice (Evans et al., 2013).

Finally, little of the current higher educational leadership literature applies a team perspective. Leadership studies in higher education mainly (1) describe leadership in other collaborative forms (e.g., staff, faculty, networks, or departments; Evans et al., 2013; Furco & Moely, 2007), (2) detect other outcomes of leadership (e.g., job satisfaction in Trevelyan, 2001; alignment in Bui and Baruch, 2012; or group organizational citizenship behavior in Akbari, Kashani, and Hooshmand Chaijani, 2016), or (3) perceive leadership as an outcome (Jones et al., 2014). This results in a lack of evidence on how team leadership behavior can support learning behavior in university teacher teams.

In sum, providing team leadership behavior seems to be a promising way to support university teacher team learning behavior, but empirical specification on how this should be done appears to be lacking. To explore the existing knowledge about leadership for team learning, this dissertation draws upon 20 years of research conducted across a range of domains on the role of team leadership behavior in supporting team learning behavior.

TEAM LEADERSHIP BEHAVIOR FOR SUPPORTING TEAM LEARNING BEHAVIOR

Current conceptualizations in the literature on leadership in higher education seem to align with literature on team leadership in other fields. In general, both seem to distinguish vertical (top-down or formal leadership from a hierarchical position), shared sources of leadership (leadership that is distributed to or originates from multiple sources such as team members), and multiple styles of leadership (e.g., balancing creativity and structure) (Pearce & Sims, 2002). To further define these

conceptualizations, we conceptualize team leadership from the behavioral perspective (Burke et al., 2006). These behaviors are seen as processes that take place at a team level:

> *Leadership is the process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives (Yukl, 2010, p. 8).*

Vertical team leadership behaviors are leadership behaviors that stem from a single, formally-appointed team leader (Pearce & Sims, 2002). Shared team leadership behavior occurs when team members themselves engage in team leadership behaviors as a dynamic or distributed influence between team members to influence and facilitate each other (Pearce & Conger, 2003). Research shows that vertical and shared leadership behaviors can co-exist in teams (Pearce & Sims, 2002). In addition, both vertical and shared leadership sources are found to stimulate team learning behavior. Since team members do not automatically engage in team learning behavior because of the problems it can cause them, they need these forms of encouragement (e.g., Edmondson et al., 2001; Lee et al., 2010; McKeown, 2012). Vertical leaders can, for example, stimulate team learning behavior by providing feedback and advice (Burke et al., 2006). When team leadership behaviors are shared among team members, hindering power differences are replaced by more open interaction (Brooks, 1994).

We argue that both vertical and shared leadership sources are needed to stimulate team learning behavior, and that both sources need to apply different team leadership styles in order to provide just enough structure, encouragement, and autonomy to bring about change. Burke et al. (2006) has grouped the most frequently studied styles of team leadership behavior into two categories: person-focused and task-focused. Person-focused behaviors focus on team members' relationships, communication and intelligence through encouraging interaction (e.g., consideration), fostering self-management (e.g., empowering), and seeking alternatives that move beyond routines (e.g., transformational). Task-focused behaviors focus on team goals, methods, and outcomes through specifying and structuring tasks (e.g., initiating structure) and monitoring team performance (e.g., transactional). Both styles are found to support team learning behavior. A person-focused style, for example, does this by proposing new approaches to enhance disclosing expertise (Lee et al., 2010). A task-focused style does this by emphasizing progress that can encourage members to engage in team learning behavior to demonstrate their skills and knowledge (Ashauer & Macan, 2013). This dissertation argues that the specific team task determines which style is most beneficial for team learning behavior: task-focused leadership behaviors to reinforce routines and person-focused to foster innovation (Kostopoulos & Bozionelos, 2011; London, 2014).

Despite these growing empirical insights, we still have no full answer as to how team leadership behavior can stimulate team learning behavior. The main reason for this is that the different sources and styles are generally studied separately and do not consider the specific team task (Zaccaro et al., 2008). First, studies on team leadership behavior rarely include both vertical and shared team leadership behavior, and if at all, they relate the two leadership sources solely to team performance rather than to team learning behavior (Burke et al., 2006; Nicolaides et al., 2014; Pearce & Sims, 2002). Second, research on how multiple styles of leadership behavior relate to team learning behavior is limited (Zaccaro et al., 2008). Third, no tests have yet examined the suggestion that the team task determines which specific team leadership style is most beneficial for team learning behavior. This is because team leadership research rarely integrates multiple leadership styles and sources with team learning behavior and neglects specific team contexts such as tasks (Edmondson et al., 2007). This dissertation therefore investigates multiple leadership styles and sources related to team learning behavior with respect to the specific team task, in the context of university teacher teams.

THE ROLE OF THE TEAM TASK IN SUPPORTING TEAM LEARNING BEHAVIOR

Our focus is on university teacher teams that need to work towards educational change. We reasoned that to bring about change they need to engage in team learning behavior. However, we question whether all university teacher teams sense the urgency for change. They may not realize they need each other's input, new ideas, and critical analysis, given their working tradition of independence (Cox, 2004), hesitation of discussing opposing ideas (Roxå & Mårtensson, 2009), and tendency to neglect (the need for) innovative ideas (Furco & Moely, 2012). Therefore, connecting university teachers in teams with the task to develop educational change does not necessarily mean they recognize this task as such, which might hinder their engagement in team learning behavior. For instance, Imants, Wubbels, and Vermunt (2013) showed that secondary school teachers' perceptions of their collaborative task to develop educational change strongly influenced whether they felt the urge to engage in collaborative learning behaviors. As such, we argue that the role of how university teacher team members perceive their task needs to be included when studying teacher team learning behavior.

We define the specific team task and its role for team learning behavior by including four task features: the level of the task interdependency, novelty, structure, and complexity. Task interdependency implies that "one perceives that one is linked with others in a way so that one cannot succeed unless they do (and vice versa) and/or that one must coordinate one's efforts with the efforts of others to complete a task" (Johnson and Johnson 2003, p.173). Accordingly, when

members see that their effort is needed, they increase their contribution to interactions and take contributions of others more seriously, which subsequently benefits their engagement in team learning behavior (Van den Bossche et al., 2006). Task novelty is defined as the number of new or unknown elements (Edmondson et al., 2007; Hoegl et al., 2003). We argue that the higher the number of new elements that the team members recognize, the more likely it is they will sense the need to develop new knowledge together. If they sense it is enough to sustain the status quo and adhere to what is already known to succeed, that reduces opportunities for engaging in team learning behavior (Edmondson et al., 2007; Hoegl et al., 2003). Task structure refers to the extent to which the task, methods, and outcomes are observed as prescribed/given or open/unpredictable (Ellström, 2001). If a task is left open for them to define, team members may feel the need to construct the task themselves, develop new methods, and deal with uncertain outcomes together (Ellström, 2001). Subsequently, this may increase the chances of them engaging in team learning behavior. Task complexity involves recognizing the difficulty of the task and any absence of standard solutions (Cooke et al., 2001; De Dreu and Weingart, 2003). If a task is perceived as highly complex, it is argued that university teacher team members are more likely to collaborate and interact to solve the difficult and unstandardized problem (Cooke et al., 2001; De Dreu and Weingart, 2003).

This dissertation uses these task features to determine the specific team task. We distinguish two types of team tasks: adaptive and developmental tasks. This variation is based on Ellström (2001) who discussed that tasks can vary in levels of structure and novelty. Adaptive tasks have a medium to high degree of structure, and contain some new elements (Devine, 2002; Ellström, 2001). Typical examples of team activities for adaptive tasks are executing, coordinating, service applying, training, caring, operating, and producing (Cohen & Bailey, 1997; Devine, 2002). By contrast, developmental tasks are not prescribed, have a medium to low degree of structure, and contain many new elements (Devine, 2002; Ellström, 2001). Typical team activities for developmental tasks are improving, designing, researching, dissolving, and creating (Cohen & Bailey, 1997; Devine, 2002). We situated team tasks on a continuum. Tasks with low interdependence, novelty, and complexity and a high degree of structure require team members to work towards routine; whereas tasks with high interdependence, novelty, and complexity and a low degree of structure require teams to work towards innovation. This is illustrated by Figure 1.2.

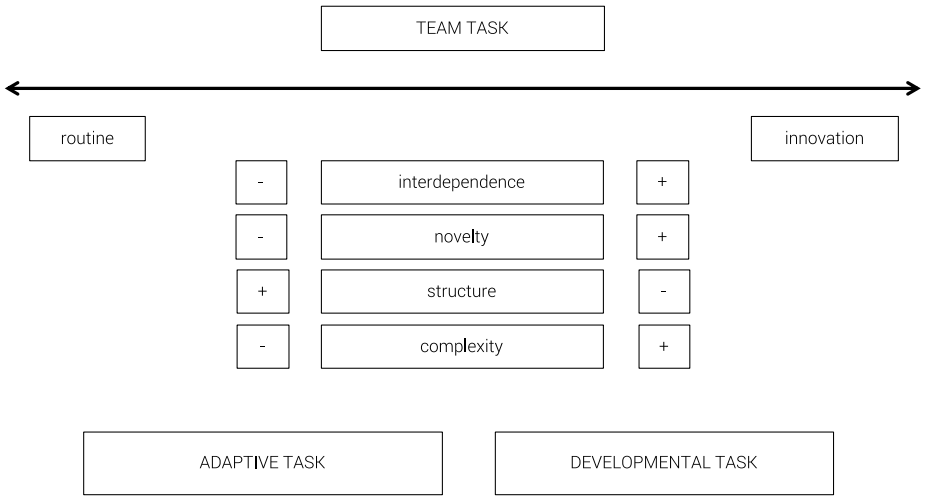

Figure 1.2 Determination of the specific team task, based on Ellström (2001)

We argue that the specific team task influences the relationship between team leadership behavior and team learning behavior. Kostopoulos and Bozionelos (2011) showed that for adaptive tasks, teams adapt their knowledge to the new elements to be effective (e.g., as in the case of a medical team following a known protocol in a new situation). These teams can rely on existing knowledge because they can build on known methods and predict results to some extent. By contrast, Kostopoulos and Bozionelos (2011) showed that developmental tasks require the development of new knowledge to be effective because they work with unknown methods and open results (e.g., as in the case of a product development team designing an innovative product). Based on these differences, the most effective team leadership behavior to support team learning behavior may also differ for the two task types (Vera & Crossan, 2004). For example, London (2014) suggested that supporting the learning behavior of teams with adaptive tasks necessitates task-focused team leadership behaviors that reinforces exploitation and the use of protocols. Furthermore, London (2014) proposed that learning behavior in teams dealing with developmental tasks is most supported by person-focused behavior that promotes creativity. To date, however, these hypotheses have rarely been tested, since studies on team leadership do not integrate multiple leadership styles and sources with team learning behavior (Edmondson et al., 2007).

In addition, in the context of university teacher teams developing educational change, we argue that the task perception of these team members should be taken into account to establish when team leadership behavior supports their team learning behavior. This dissertation argues that having the developmental task of developing educational change does not automatically mean teachers recognize their task as being developmental (e.g., Imants et al., 2013). Accordingly, teacher

teams who perceive their task as adaptive and do not immediately realize they need each other to succeed might need other team leadership behaviors than teams who recognize they have a developmental task that requires collaboration and interaction. As such, these teams might need different team leadership behavior to support their learning behavior. For these reasons, this dissertation includes the specific team task as a moderator between team leadership behavior and team learning behavior to establish how team leadership behavior supports team learning behavior with respect to the specific team task. This is illustrated in the conceptual model that forms the basis for this dissertation.

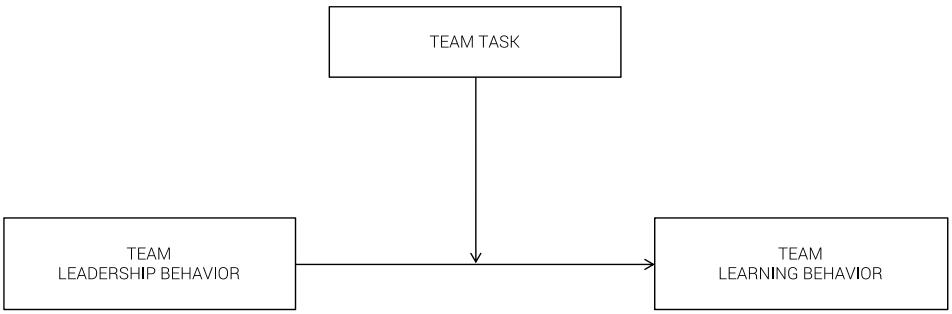

Figure 1.3 Basic conceptual model of this dissertation

Figure 1.3 places team leadership behavior in the position of key driver for stimulating the team learning behavior required for developing educational change. We suggest that the team task determines what kind of team leadership behavior is needed to support team learning behavior.

TEAM LEADER COGNITION

We argue that team leaders need to use and recognize the different team factors and to be able to choose between different styles of team leadership behavior in order to optimally support team learning behavior for a specific team task. However, it is unknown if team leaders are aware of this (Day et al., 2009). To further explore how they can support team learning behavior, we look at both team leadership behavior and at how team leaders think about leadership and the team situation (Day et al., 2009).

One of the reasons we include this is because Wood and Bandura (1989) concluded that leader behavior is influenced by how leaders think and how they interpret situations as an interplay between cognitions, behavior, and context. Therefore, to understand the behavior of team leaders, we need to observe both team leadership behavior as well as team leader cognitions on how they perceive leadership and interpret team situations (Day et al., 2009). Team leader cognitions can

be defined as knowledge structures that represent how team leaders (1) perceive leadership and (2) interpret their specific team situation. These two building blocks are based on the reciprocal interplay between cognitions, behavior, and context (Wood & Bandura, 1989). Hodgkinson (2003) reasoned that behavior is influenced by conceptually driven (e.g., leadership perspectives) and stimuli-driven (e.g., team factors) structures that organize how people mentally process information. This is illustrated by Figure 1.7. Conceptually driven structures simplify and structure the situation based on mental representations that are developed from past experiences and learning (Hodgkinson, 2003). Stimuli-driven structures interpret the situation through the key context factors that individuals know. These structures are used to process information, to structure the situation mentally, and to subsequently guide behavior (Hodgkinson, 2003).

This dissertation includes three leadership perspectives varying from (1) a top-down influence (personal dominance) to the team, to (2) a two-way (interpersonal influence) between the leader and the team, and then (3) a dynamic influence process (relational dialogue) within the team (Day & Harrison, 2007; Drath, 2001; Lord & Hall, 2005). We define the specific team situation by team factors, which in this dissertation are different types of team leadership behaviors, team tasks, team learning behaviors, and interpersonal learning conditions (i.e., team psychological safety and team efficacy).

Hooijberg, Hunt, and Dodge (1997) argued that a high diversity of perspectives and concepts enables leaders to judge a situation and apply behavior that is meaningful in that specific situation. In this dissertation, a high diversity means being able to use, recognize, and integrate different leadership perspectives and team factors when perceiving and interpreting team situations. For example, team leaders supporting team learning behavior for developmental tasks may choose to emphasize co-constructing knowledge instead of favoring only sharing knowledge. Furthermore, team learning behavior can also stem from shared sources, which suggests that team leaders need to be aware of this and that they can build on and extend the influence of all team members (Day, Gronn, & Salas, 2004). Having cognitive diversity aligns with modern concepts of leadership, such as collective leadership (Raelin, 2017), which combines vertical and shared leadership sources and adapts to the specific team situation. This is in contrast to traditional leadership theories that mainly view leadership as a rather small and one-way, top-down influence from a leader to their followers (Raelin, 2017). As such, to understand how team leadership behavior can support team learning behavior we also need to know more about underlying team leader cognition that is argued to guide leadership behavior (Day & Harrison, 2007).

However, remarkably little is known about team leader cognition (Day et al., 2009). Team research provides many insights into team leadership behavior (Burke et al., 2006), but leadership cognition studies mainly appear in traditional

leader-follower research instead of research on leadership in teams (Day, Fleenor, Atwater, Sturm, & McKee, 2014). As a consequence, empirical knowledge on the cognition of team leaders is absent (Day et al., 2009). We aim to address this research gap and add a cognitive perspective to team leadership by exploring team leader cognitions.

OUTLINE OF THIS DISSERTATION

This dissertation investigates how team leadership behavior can support the learning behavior of university teacher teams to work towards educational change. We use four studies to (1) increase understanding of team learning behavior in the context of higher education [studies 1 and 3], (2) investigate how different styles and sources of team leadership behavior support team learning behavior for specific team tasks [studies 2 and 3], and (3) add a cognitive perspective to team leadership research by exploring how team leaders perceive leadership and interpret specific team situations [Study 4]. The four studies are conducted consecutively, each building on key findings from the former and using a different methodology.

STUDY 1
EXPLORING HOW UNIVERSITY TEACHER TEAMS ESTABLISHED BY AN ORGANIZATION LEARN TO DEAL WITH THEIR TEAM TASK

The first study (chapter 2) explores how team leadership behavior, team tasks, and team learning behavior are experienced by university teachers in teams formally established to deal with a complex task that requires team learning behavior (illustrated by Figure 1.4).

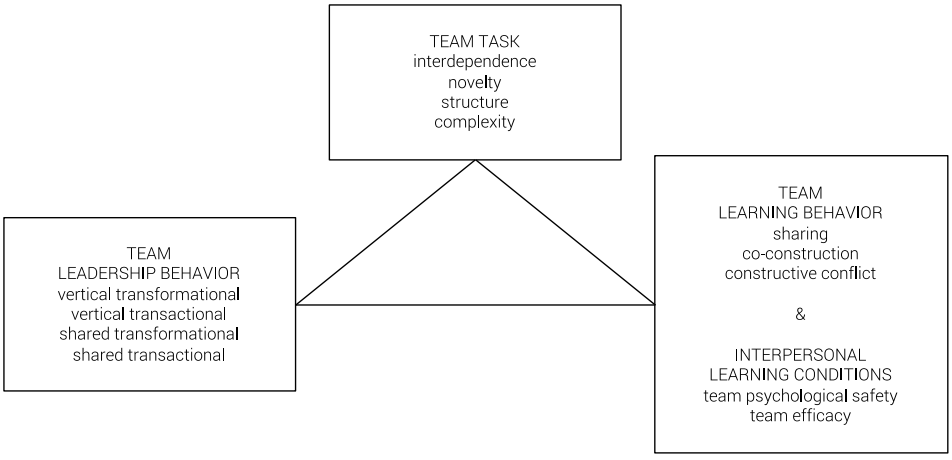

Figure 1.4 Model for first study

More specifically, in Study 1 (chapter 2) we interview team members from different university teacher teams to explore the role of team members' perceptions of their team's learning behavior (i.e., sharing, co-construction, constructive conflict), tasks (i.e., the interdependence, novelty, structure, and complexity of a task), and leadership behavior (i.e., vertical and shared, transformational and transactional). Transformational leadership behavior is included as a form of person-focused team leadership behavior and involves encouraging teams to seek alternatives and challenge the status quo (Bass & Avolio, 1994). Transactional leadership behavior is a task-focused style that is concerned with setting team goals and monitoring progress (Bass & Avolio, 1994). In addition, we add team psychological safety and team efficacy in Study 1. These two interpersonal learning conditions are included to view how these social aspects of team learning behavior effect university teacher teams, in addition to the cognitive aspects of sharing, discussing, and constructing knowledge. Team psychological safety is the belief among team members that they can openly share their ideas and knowledge without embarrassment or rejection (Edmondson, 1999). Team efficacy refers to a belief that the team is capable of achieving team goals, developing working methods, and persevering when faced with setback (Gully, Incalcaterra, Joshi, & Beaubien, 2002). Research has shown that these interpersonal learning conditions set a safe and challenging social atmosphere to engage in team learning behavior (Decuyper et al., 2010; Edmondson, 1999; Gully et al., 2002; Lee et al., 2010). These interpersonal learning conditions might also be important for university teachers, as they are not used to discussing personal knowledge and ideas with their colleagues (e.g., Furco & Moely, 2012).

The findings of Study 1 suggest that team learning behavior can occur in different ways. The results imply that team leadership behavior and how members perceive their task play important roles for team learning behavior; more than interpersonal learning conditions.

STUDY 2
META-ANALYZING WHEN TEAM LEADERSHIP BEHAVIOR SUPPORTS TEAM LEARNING BEHAVIOR

Study 2 (chapter 3) builds on Study 1 by further specifying the influence of team leadership behavior on team learning behavior with respect to the specific team task. We chose to do this before examining the emerging patterns of Study 1 on a larger scale. We conduct a comprehensive meta-analysis to find empirical knowledge about this influence across contexts, based on the model of Figure 1.5. What empirical knowledge is there about the influence of team leadership behavior on team learning behavior with respect to the specific team task? In Study 2, we aim to identify guidelines from other contexts to further support our

interdisciplinary approach. We include studies conducted on all available team contexts, such as surgery teams, new product development teams, business management teams, and commercial banking teams.

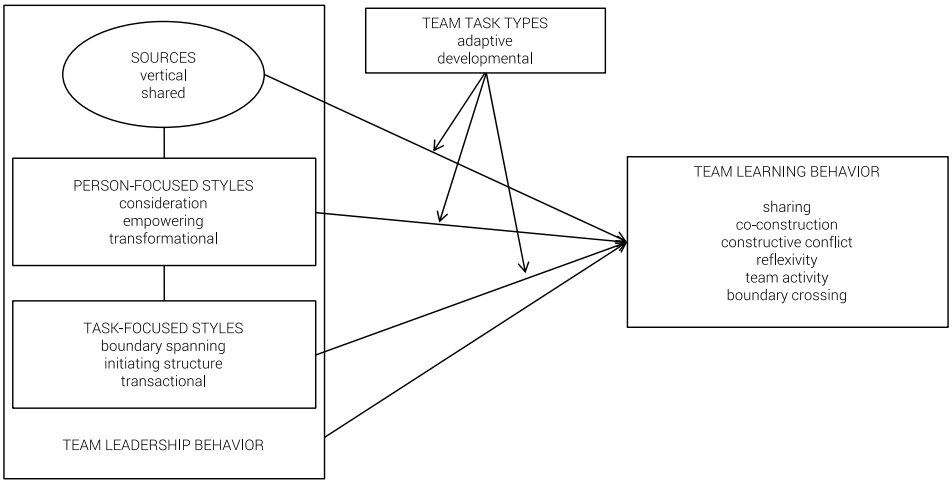

Figure 1.5 Model for second study

The meta-analysis examines the overall and the specific influence of different team leadership behavioral sources (i.e., vertical and shared) and styles (i.e., person-focused and task-focused) on team learning behavior (i.e., a combination of sharing, co-construction, constructive conflict, reflexivity, team activity, and boundary crossing), and how the type of team task (i.e., adaptive or developmental) moderates the effect of (sources and styles of) team leadership behavior on team learning. Based upon Burke et al. (2006), consideration (e.g., setting a climate for interaction), empowering (e.g., emphasizing teamwork), and transformational (e.g., challenging the status quo) team leadership behaviors are included as person-focused styles. The team leadership behaviors included for task-focused styles are boundary crossing (e.g., using external information in the team), initiating structure (e.g., prescribing tasks), and transactional (e.g., monitoring performance) (Burke et al., 2006). In addition, this meta-analysis synthesizes what is empirically known about the influence of different types of team leadership behavior on team learning behavior. The moderator analysis on team tasks for those relationships provides new empirical knowledge (e.g., Edmondson et al., 2007). Furthermore, the findings of Study 2 contribute to the selection of instruments used to build the research model for Study 3.

STUDY 3
EXAMINING WHEN TEAM LEADERSHIP BEHAVIOR SUPPORTS LEARNING IN UNIVERSITY TEACHER TEAMS RESPONSIBLE FOR EDUCATIONAL CHANGE

The third study (chapter 4) returns to the context of university teacher teams. We look at how the patterns detected in Study 1 unfold on a larger scale, guided by directions from empirical knowledge in other contexts as synthesized by Study 2. We build on Study 1 and analyze when leadership supports team learning behavior in the context of university teacher teams working towards educational change. This analysis is based on the model displayed in Figure 1.6.

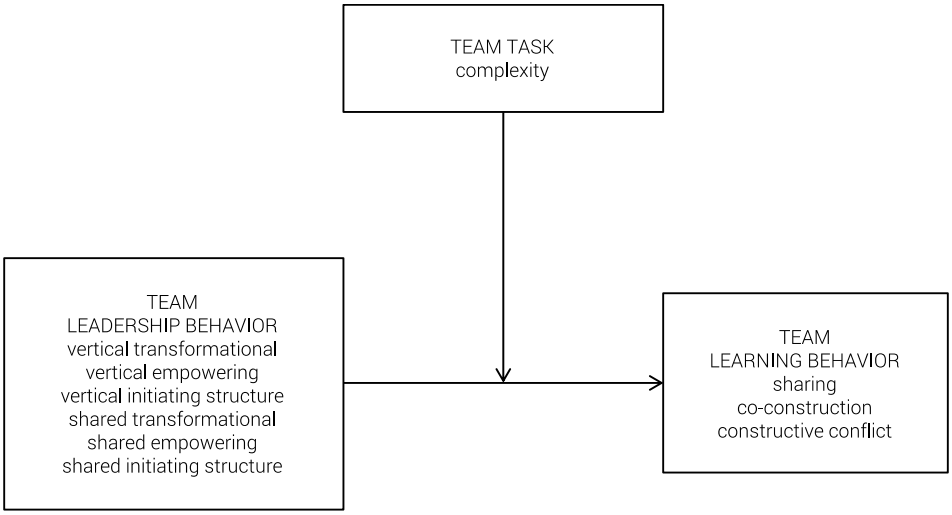

Figure 1.6 Model for third study

Study 3 includes team leadership behaviors derived from Study 2. We examine which types of team leadership behavior (i.e., two person-focused and one task-focused from vertical and shared sources) support team learning behavior in university teacher teams working towards educational change. In addition, building on the results of Study 2, we aim to test how team tasks moderate these relationships in our specific context. We look at the extent to which these university teacher teams differ in how they sense the task complexity, and as such require different types of team leadership behavior to support their team learning behavior.

STUDY 4
EXPLORING LEADERSHIP PERSPECTIVES AND TEAM FACTORS IN TEAM LEADER COGNITIONS WHEN VIEWING TEAM SITUATIONS

The first three studies provide directions for team leaders on the kind of leadership behaviors that support team learning behaviors, given a certain team task. Different types of team leadership behavior (i.e., transformational, empowering, and initiating structure), team tasks (i.e., interdependence, novelty, structure, and complexity) and team learning behaviors (i.e., sharing, co-construction, constructive conflict, reflexivity, team activity, and boundary crossing) appear to play important roles in teams. But to what extent do team leaders actually use and recognize this diversity of team factors? And are they able to apply different approaches (i.e., leadership perspectives) to influence teams, or do they only perceive leadership as a top-down process? Study 4 (chapter 5) takes this next step and explores cognitions of leaders of teams working towards educational change at universities. Similar to Study 1, Study 4 also includes the two interpersonal learning conditions 'team psychological safety' and 'team efficacy'. It explores the extent to which team leaders are aware of different styles of team leadership behavior. The model for Study 4 is illustrated by Figure 1.7.

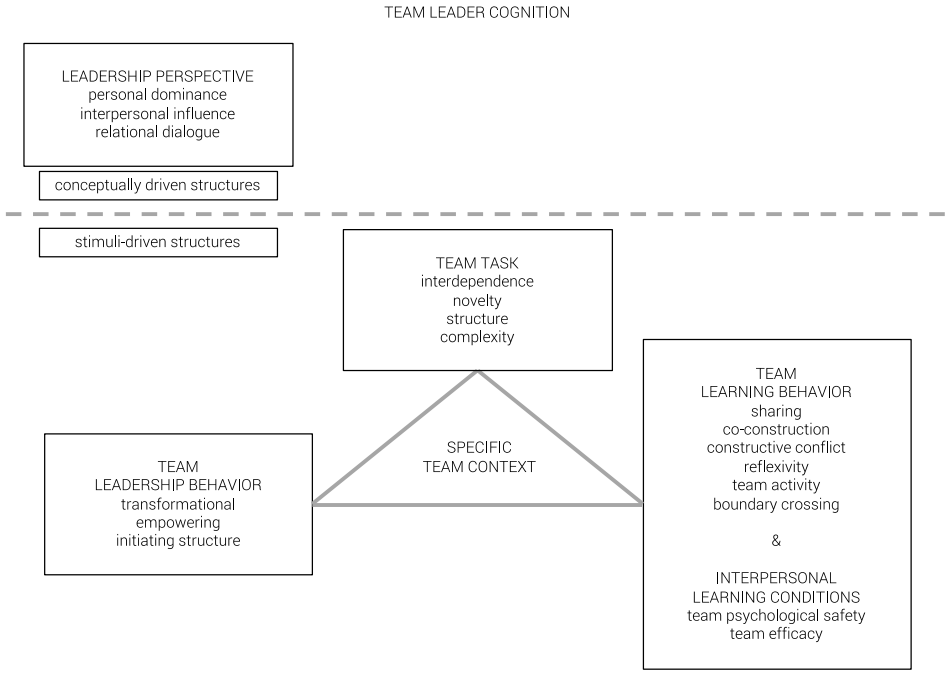

Figure 1.7 Model for fourth study

We use different elicitation techniques in semi-structured interviews to detect which leadership perspectives and team factors team leaders use and recognize when viewing team situations. The final study in this dissertation builds on the findings of the first three studies and contributes towards a cognitive turn in team leadership research. Hence, we aim for the insights of Study 4 to offer new directions for the training and development of team leaders on how to provide meaningful support for their teams.

Chapter 6 provides an integration and discussion of the key findings of the four studies, and discusses limitations, recommendations for future research, and practical implications related to leadership for team learning.

Please note that this dissertation contains a collection of closely-related articles that have been published (chapters 2 and 3) or are under review (chapters 4 and 5) in journals. Each chapter was written to be read on its own, so there is inevitable repetition and overlap across chapters.

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2 LEADERSHIP FOR TEAM LEARNING: THE CASE OF UNIVERSITY TEACHER TEAMS

ABSTRACT

Teacher team involvement is considered a key factor in achieving sustainable innovation in higher education. This requires engaging in team learning behaviors that should result in new knowledge and solutions. However, university teachers are not used to discussing their work practices with one another, and tend to neglect any innovation in their tasks. Team leadership behavior is often considered essential for stimulating team learning behavior, but it is unclear how this transpires. Therefore, the present study explores university teacher team members' perceptions of team learning behavior, their assigned task, and leadership behaviors in their team. Interviews were conducted with 16 members of different teacher teams at a university of applied sciences. Findings included that the vast majority of the team learning behaviors only involved sharing ideas; engaging in constructive conflicts and co-constructions was not observed. Only a few teams combined all three team learning behaviors. In these teams, members observed that existing methods and solutions were no longer adequate, with leaders appearing to combine transformational and transactional behaviors, but operating from a distance without actively interfering in the process. Furthermore, these team members shared leadership behaviors while focusing on the team as a whole, instead of solving problems at individual level. This strongly indicates that task perception and specific vertical and shared team leadership behaviors play a role in stimulating teachers in seeking controversy and co-constructing new knowledge.

THIS CHAPTER IS BASED ON:

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The consequences of continuous technological improvements, increasing accountability, and changes in working life require new responses from higher education. New modes in the delivery of education, pedagogy, and teaching are often called for (e.g., Barber, Donnelly, & Rizvi, 2013; Fullan & Scott, 2009; Kezar, 2011). However, acknowledging the importance of change does not automatically result in successful innovations. University teacher's involvement appears to be a key factor for sustainable educational change (e.g., Emo, 2015; Van Driel, Verloop, Van Werven, & Dekkers, 1997) and connecting these professionals has been identified as one of the basic requirements for complex change processes to achieve innovation (e.g., Kotter, 2012).

In this regard, it has been suggested that encouraging university teachers to work on an innovative task together does play a crucial role in achieving educational change. Innovative tasks are defined here as highly novel, complex, and low-structured (De Dreu & Weingart, 2003; Devine, 2002; Hoegl, Praveen Parboteeah, & Gemuenden, 2003). Fullan (2010) suggests that working together on an innovative task potentially offers university teachers the opportunity of combining multiple inputs in identifying the need for innovation, developing ownership, and designing, implementing, and evaluating solutions. Roxå and Mårtensson (2015) argue that collaboration between university teachers takes place in various forms, and that collaborative forms of innovation are mainly characterized by a shared responsibility for educational development. However, Vangrieken, Dochy, Raes, and Kyndt (2015) question the extent to which collaborating university teachers in fact share and follow up on this responsibility. Cox (2004) observed that university teacher's work tradition is largely solitary, with high levels of individual autonomy. This work tradition also exists in secondary education, with Brouwer, Brekelmans, Nieuwenhuis, and Simons (2012) finding that when teachers collaborate, their interdependency is seldom task-related, leading to a low shared outcome responsibility and accountability. Yet research outside the educational domain also provides ample evidence that teams of professionals that are interdependent and share responsibility can be very successful in tackling innovative tasks (e.g., Lee, Gillespie, Mann, & Wearing, 2010; Zaccaro, Ely, & Shuffler, 2008).

Such teams are not groups of individual professionals who are loosely coupled for reasons such as simply working in the same department or sharing an interest (Katzenbach & Smith, 1993). In contrast, a team is "a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems" (Cohen & Bailey, 1997, p. 241). This task interdependency and shared responsibility distinguishes teams from other forms of collaboration (Katzenbach & Smith, 1993). This study uses a team perspective to investigate teacher collaboration for innovation in higher education. First, because teams appear to be very effective for achieving innovation (Zaccaro et al., 2008).

Second, Roxå and Mårtensson (2015) reasoned that collaborative forms for innovation in higher education are mainly characterized by sharing a responsibility for educational development. A team approach is in line with that reasoning, because in such an approach teachers formally share responsibility and task interdependency exists. Third, studies on teacher collaboration are hardly ever conducted in higher education (Kezar, 2014; Vangrieken et al., 2015), while overall there are few studies on effective conditions and outcomes of teacher collaboration for educational innovation (Little, 2006; Vescio, Ross, & Adams, 2008). Therefore, this study builds on studies performed in organizational and educational contexts (e.g., Crow & Pounder, 2000). When describing the context, higher education literature takes precedence, although studies conducted in secondary education were also used where the former was lacking, since the setting has similar features (e.g., Kezar, 2014), such as the tradition of professionals working solitarily and autonomously (Brouwer et al., 2012; Cox, 2004; Van Waes, Van den Bossche, Moolenaar, Stes, & Van Petegem, 2015), and the tendency of teachers to avoid change (Furco & Moely, 2012; Van Eekelen, Vermunt, & Boshuizen, 2006).

Research shows that effective teams with an innovative task can adapt to new situations and develop new knowledge together through engaging in team learning behaviors, which in turn explains their success (Lee et al., 2010; Srivastava, Bartol, & Locke, 2006). Decuyper, Dochy and Van den Bossche (2010) define such behaviors in terms of three essential learning behaviors: sharing, constructive conflict, and co-construction. Team members who demonstrate all three learning behaviors can build new knowledge, solve complex problems, and develop innovative solutions collectively (Paavola, Lipponen, & Hakkarainen, 2004; Van den Bossche, Gijselaers, Segers, & Kirschner, 2006). Team effectiveness depends on these team learning behaviors and also encompasses interpersonal factors (Edmondson, 1999). In this regard, team psychological safety and team efficacy appear to be conditional for team learning behaviors (Edmondson, 1999; Gully, Incalterra, Joshi, & Beaubien, 2002).

Despite evidence that a team approach can be successful for innovation in different contexts, simply bringing together university teachers in teams with an innovative task may not be enough (e.g., Fullan & Scott, 2009). University teachers' team learning behavior needs to be encouraged for a number of reasons. Firstly, Cox (2004) showed that university teachers operate in a long tradition of solitariness and are not used to sharing and discussing their practices together. It appears that they need to feel safe in a social sense before they engage in such collaborative learning behaviors (Roxå & Mårtensson, 2009; Van Waes et al., 2015). Secondly, establishing teams for innovative purposes does not automatically mean that the team members will acknowledge the innovative features of their team task. This is reflected in the review of Timperley, Wilson, Barrar, and Fung, (2007), which showed that collaborating secondary school teachers tend to seek support for the status quo, and

marginalized or even ignored new ideas. This adherence to routine might be also present in higher educational contexts, which could hinder university teacher's need to engage in team learning behaviors. Furco and Moely (2012) showed that university teachers need support from their faculty in taking the perceived risk of sharing practices and co-constructing new methods. Therefore, several authors claim that the readiness of university teacher teams to become engaged in collaborative learning depends heavily on how this is encouraged and facilitated by team leadership (Furco & Moely, 2012; Kezar, 2005; Roxå & Mårtensson, 2009).

Many studies across a wide variety of settings have shown that team leadership behavior plays an important role in fueling team learning behavior (Bucic, Robinson, & Ramburuth, 2010; Burke et al., 2006; Harris, 2011). For example, Lee et al. (2010) found that leaders who inspired and encouraged team members in developing new ideas and trying different approaches supported team learning behaviors in innovative IT teams. Additionally, Bryman (2007) and Van Ameijde, Nelson, Billsberry, and Van Meurs (2009) showed that sharing such leadership behaviors can motivate university teachers facing innovative tasks collaboratively, because it provides a sense of team ownership (e.g., Carson, Tesluk, & Marrone, 2007; Pearce, Conger, & Locke, 2008). However, most studies do not integrate multiple types of leadership behaviors, or are mainly focused on the leadership behaviors of a single vertical leader (Avolio, Walumbwa, & Weber, 2009). Such research also predominately focuses on team performance as an outcome, and not on team learning (Burke et al., 2006; Nicolaides et al., 2014). Moreover, research on the influence of team leadership on teacher team learning is lacking, because empirical studies on stimulating collaborative teacher learning are limited (Little, 2006; Vescio et al., 2008) and mostly do not concern teams but collaboration forms with lower levels of task interdependence and shared responsibility (Brouwer et al., 2012; Vangrieken et al., 2015). In addition, these studies have mainly been conducted in primary and secondary education, and rarely in higher education (Kezar, 2011; Vangrieken et al., 2015). For these reasons, this study aims to understand how university teacher teams established by the organization learn to deal with their task together. This will be done by exploring the role of team members' perceptions of learning, their task, and the leadership behaviors in their team.

LEARNING IN TEACHER TEAMS

Decuyper et al. (2010) identify three essential team learning behaviors: sharing, constructive conflict, and co-construction. *Sharing* is defined as "the process of communicating knowledge, competencies, opinions or creative thoughts of one member to other team members, who were not previously aware that these were present in the team" (Decuyper et al., 2010, p. 116). *Constructive conflict* is viewed as "a conflict or an elaborated discussion that stems from diversity and open

communication, and leads to further communication and some kind of temporary agreement" (Decuyper et al., 2010, p. 117). In a constructive conflict, differences are "negotiated by arguments and clarifications" (Van den Bossche, 2006, p. 91). Finally, *co-construction* refers to the process of developing shared knowledge and building shared meaning "by refining, building on, or modifying an original offer in some way" (Baker, 1994, in Van den Bossche et al., 2006, p. 495). According to Van den Bossche (2006), "the outcome of this process is that 'new' meanings emerge in the collaborative work that were not previously available to the team" (p. 91). All three team learning behaviors are deemed relevant for developing innovative solutions collectively: sharing the available cognitive resources and unique expertise, integrating different viewpoints, and collaboratively building new knowledge (Lee et al., 2010; Paavola et al., 2004).

It is crucial to not only consider the cognitive aspect of team learning, but to include the social process as well (Van den Bossche et al., 2006). Roxå and Mårtensson (2009) showed that university teachers needed to feel safe and to experience mutual trust to engage in collaborative learning behavior, because performing such behaviors is risky and causes uncertainty. This phenomenon has been studied extensively in primary and secondary education, where teachers' traditional work climate is characterized by ignoring differences and pursuing support and consensus, rather than questioning and seeking professional disagreements (Hargreaves, 2001). Kwakman (2003) showed that secondary school teachers preferred sharing views only, and that they perceived disagreements as threatening instead of viewing them as opportunities to examine opposite views. Van Eekelen et al. (2006) also found that secondary school teachers preferred a predictable, routine approach to work, and therefore tend to avoid risks. According to them, this anxiety caused by change was due to low self-efficacy (Bandura, 1997). Therefore, in this paper we argue that university teacher team learning should be studied as both a cognitive and a social process (e.g., Roxå & Mårtensson, 2009; Van den Bossche et al., 2006).

Across domains, psychological safety and team efficacy have been consistently identified as important interpersonal factors for team learning (Decuyper et al., 2010; Gully et al., 2002). Edmondson (1999) referred to *team psychological safety* as a "sense of confidence that the team will not embarrass, reject or punish someone for speaking up" (p. 354), and added that team members do not feel rejected when putting themselves at risk, for example by seeking feedback, admitting errors or asking for help. *Team efficacy* is defined as the collective perceived ability to work together to achieve goals (Bandura, 1997). Collins and Parker (2010) showed that a strong belief in a team's abilities leads to more ambitious goals, to the development of strategies to achieve those goals, and to increased persistence in the face of setbacks. Psychological safety and team efficacy might also lead to social support for university teacher team members in taking risks and overcoming problems.

THE ROLE OF TASK PERCEPTION ON TEAM LEARNING BEHAVIOR

We argue that a team's task is not an objective fact: it depends on its members' perceptions of the task, given their attitudes and work experience. Imants, Wubbels, and Vermunt (2013) showed that secondary school teachers' perceptions of their collaborative task regarding educational change strongly influenced their attitudes towards engaging in collaborative learning behaviors. Similarly, research in other domains shows that recognizing task features, such as interdependency and innovativeness, can be expected to support team learning behaviors (Hoegl et al., 2003; Van Eekelen et al., 2006). *Task interdependency* means that "one perceives that one is linked with others in a way so that one cannot succeed unless they do (and vice versa) and/or that one must coordinate one's efforts with the efforts of others to complete a task" (Johnson & Johnson, 2003, p. 173). When members see their effort is needed, they increase their contribution, which subsequently benefits team learning (Johnson & Johnson, 2003). *Task innovativeness* contains three elements: novelty, structure, and complexity. *Task novelty* is the perceived amount of new or unknown task elements (Edmondson et al., 2007; Hoegl et al., 2003). *Task structure* refers to the extent to which the task, methods, and outcomes are observed as prescribed/given or open/unpredictable (Ellström, 2001). *Task complexity* involves recognizing the task's difficulty and any absence of standard solutions (Cooke, Kiekel, & Helm, 2001; De Dreu & Weingart, 2003).

In contrast to perceiving a task as repetitive or routine, innovative tasks are perceived as highly novel, low-structured and highly complex (De Dreu & Weingart, 2003; Devine, 2002; Hoegl et al., 2003), which is argued to trigger team learning behaviors (Edmondson, Roberto, & Watkins, 2003). Perceiving task novelty as high could stimulate team members to collectively develop new solutions instead of adhering to the status quo (Hoegl et al., 2003). Observing low-structured tasks implies team members may feel the need to clarify their task, develop new methods, and deal with ambiguous outcomes together (Devine, 2002). If team members perceive task complexity as high, this suggests they are more likely to collaborate in order to solve their difficult and unstandardized problem (Cooke et al., 2001; De Dreu & Weingart, 2003; Van der Haar, Segers, & Jehn, 2013).

Ellström (2001) explains the influence of task perception on team learning using two learning levels: adaptive and developmental learning. If team members perceive their task as routine, they are more likely to engage in "adaptive learning". In that case, sharing is considered to be enough for success (Paavola et al., 2004). In contrast, perceiving the task as innovative means it is likely that "developmental learning" will occur (Ellström, 2001) for which constructive conflicts and co-constructions are necessary, in addition to sharing (Paavola et al., 2004). Team members' task perception is thus argued to play a role in performing team learning behaviors (Hoegl et al., 2003; Imants et al., 2013). London (2014) also argues that

future research should focus on the role of team leadership behavior in influencing team members' task perception and, subsequently, their engagement in either adaptive or developmental learning.

THE ROLE OF TEAM LEADERSHIP BEHAVIOR IN SUPPORTING UNIVERSITY TEACHER TEAM LEARNING

Team leadership is repeatedly identified as a critical factor in supporting team learning behaviors (Burke et al., 2006; Harris, 2011). Team leadership behaviors refers to the processes of influencing and facilitating, that is, "influencing others to understand and agree about what needs to be done and how it can be done effectively; (…) facilitating individual and collective efforts to accomplish a shared objective" (Yukl, 2002, in Ensley, Hmieleski, & Pearce, 2006, p. 220). This definition includes two team leadership perspectives: style (i.e., transformational and transactional), and source (i.e., vertical and shared). Bass and Avolio (1994) operationalized the *transformational* leadership style as leaders who motivate members via behaviors such as articulating a vision, setting high expectations, questioning the status quo, and supporting the individual needs. The *transactional* leadership style consists of behaviors that establish agreements on the tasks, the necessary facilities, and the rewards for achieving them (Bass & Avolio, 1994). Transactional leaders also actively monitor team members' performance and take action when mistakes are made. When dealing with an innovative task, it is unlikely that a single, vertical leader will have all the answers and will be able to perform both leadership styles adequately (Day, Gronn, & Salas, 2004; Timperley et al., 2007). Therefore, a *shared team leadership* approach is suggested, which Carson et al. (2007) described as team leadership behaviors that stem from multiple sources: the team members themselves.

Thus far, there is no consensus on which style and source of leadership is most effective in supporting team learning (Burke et al., 2006; Nicolaides et al., 2014; Zaccaro et al., 2008). On the one hand, vertical transformational leadership behaviors appear to stimulate team learning on innovative tasks. Moolenaar et al. (2013) found such behaviors supported secondary school teachers' recognition of innovative task features, and their sense of urgency and willingness to collectively develop new knowledge. Furthermore, vertical transformational leadership behaviors appear to support team learning via promoting team psychological safety and team efficacy. Lee et al. (2010), for instance, showed that team leaders who advise and provide new information build interpersonal safety and trust, which explained 69% of the team knowledge sharing variance (e.g., Edmondson, 1999; Srivastava et al., 2006). On the other hand, Timperley et al. (2007) stressed that vertical transactional leadership behaviors are also promising for structuring collaborative teacher learning in (secondary) education. Bucic, Robinson, and Ramburuth (2010)

and Mebane and Galassi (2003) demonstrated that both vertical transformational and transactional leadership styles encouraged university teacher team learning by challenging teachers to share and by structuring the task. The reviews of London (2014) and Nicolaides et al. (2014) suggest that the most effective leadership style depends on the team's situation, such as the task features or perceived task features, but supporting evidence is limited.

To date, studies that include both leadership styles are scarce and mainly focus on a single, vertical leader (Avolio et al., 2009). However, Van Ameijde et al. (2009) found that teams in higher education benefit from shared leadership behaviors; specifically, this is the case if such behaviors involve collectively building ownership and trust, decision-making, and monitoring performance. Sharing these leadership behaviors and giving university teachers the space to perform them provides them with a degree of autonomy and influence, which can motivate them to solve complex problems collectively (Bryman, 2007). Despite the promising influence of shared team leadership, more evidence on how shared leadership behaviors fuel teacher team learning is necessary (Nicolaides et al., 2014). Therefore, this study draws upon both vertical and shared leadership, by considering that transformational and transactional leadership behaviors can both stem from a vertical leader and be shared by the team members (e.g., Bryman, 2007; Ensley et al., 2006).

METHODOLOGY

Semi-structured interviews were conducted to explore teacher team members' perceptions of team learning, tasks, and leadership.

SAMPLE AND SETTING

The study was conducted at a Dutch university of applied sciences offering bachelor's degree programs and professional post-graduate programs. This university uses a team approach to deal with complex problems. Team members from various domains (i.e., health care, technology, social sciences, arts, and management) were included, allowing variety and transferability to a broader context (Miles & Huberman, 1994). They were purposefully selected (Patton, 2002) based on the following four selection criteria (indicated by the faculty management and verified by the interviewees).

1. The team matched the team definition of Cohen and Bailey (1997).
2. The team task required team learning behavior.
3. The minimum team age was two months.
4. The minimum team size was three members.

One team member from each team was interviewed in order to provide variety in supporting our explorative aim. In total, 16 teacher team members from 16

different teams participated (7 women, 9 men). Participants' university tenure ranged between 8 months and 29 years (*M* = 10.58 years, *SD* = 9.30). Team assignments such as curriculum design, mentoring, and developing study material were represented. The team size ranged between 3 and 20 members (*M* = 8.06 members, *SD* = 5.05). The team age varied from 8 months to 27 years, (*M* = 6.65 years, *SD* = 6.39).

INTERVIEW GUIDELINE

The interview guideline was based on the theoretical framework, containing a main question and several sub-questions per topic, which were open-ended, facilitating the explorative aim of this study (Hsieh & Shannon, 2005). The questions inventoried the current situation. In development, feedback from three field experts was obtained and a pilot interview carried out. The interview guideline was then finalized (see Table 2.1 for sample questions).

PROCEDURE

Each interview lasted one hour. Before the interview started, a brief introduction was given to the procedure and the research topic, and permission was obtained to audiotape the interview. The interviews were transcribed verbatim and all participants checked their interview transcript.

CODING PROCESS

Software program MAXQDA was used to code the transcripts. The unit of analysis consisted of a "multiple chunk" (Miles & Huberman, 1994), which in this study was a meaningful segment in the response of the interviewee represented by a sentence, a part of a sentence or a set of related sentences. For data analysis, Hsieh and Shannon's (2005) directive content analysis method was followed, and the process consisted of several rounds. Transcript coding started deductively, based on the interview topics. Segments that could not be coded were analyzed and were inductively assigned to a new code or subcode. Literature was consulted to verify and deepen the operationalization of emerging codes. This coding process was repeated several times and tracked in a codebook.

The reliability of identifying meaningful segments was tested in two rounds. First, a member check in an independent research group was carried out to validate the identification of meaningful segments. Second, following the suggestions of Miles and Huberman (1994, p. 64), the first author and another trained peer researcher independently identified meaningful segments of a randomly selected 10% of the data. A total of 68 segments were identified by both researchers, of which an acceptable number of 40 segments (61%) were identical, meaning the

same text was selected. Differences were discussed and the definition of a meaningful segment was specified.

The transcripts were then coded and the codebook was audited several times in different research groups and at two conferences to test the external validity (Denzin & Lincoln, 2011; Miles & Huberman, 1994). Subsequently, a new independent second coder was trained, based on the procedures suggested by Neuendorf (2002). A total of 25% of the randomly selected meaningful segments per transcripts were coded independently. After each transcript, the reliability was calculated and differences were discussed until consensus was reached and revisions were made. The process resulted in an adequate intercoder reliability (Kappa = .70). Finally, the remaining transcripts were coded and a summary of each transcript was made, which was sent to the participants to check the internal validity (Denzin & Lincoln, 2011; Miles & Huberman, 1994). Table 2.1 presents the codes used. Their definitions followed the theoretical framework.

Table 2.1 Codes used and example interview questions

Main code	Subcode	Example interview question
Team learning behaviors	Sharing	*What kind of (learning) activities do you undertake? Do you have discussions, how?*
	Co-construction	
	Constructive conflict	
Interpersonal learning conditions	Team psychological safety	*What do you think of working in this team? Do you feel comfortable?*
	Team efficacy	*Do you think this team is capable of achieving the task successfully? Why?*
Task perception	Task interdependence	*Does your team have an assignment? Could you tell me something about your team task?*
	Task novelty	
	Task structure	
	Task complexity	
Team leadership behaviors	Vertical transformational leadership behaviors	*Is someone the leader in your team? How would you describe his/her activities?*
	Vertical transactional leadership behaviors	
	Shared transformational leadership behaviors	
	Shared transactional leadership behaviors	

After the coding process, each "task perception" subcode was inductively divided into three levels (i.e., low, mid, and high). Table 2.2 provides the decision rules, illustrated by an example. Three authors independently assigned each task perception segment to one of the three levels. Differences were discussed until consensus was reached, and the decision rules were further refined. An adequate Kappa of .72 was reached.

Table 2.2 Decision rules for distinguishing the three levels in task perception

Task perception	Low	Mid	High
	The segments…	*The segments…*	*The segments…*
Task interdependence	…state that the team member does not need the others to fulfill the task.	… contain elements that the team member is more or less dependent on the others to fulfill the task.	… state that the team member needs the others to fulfill the task.
	Example segment for mid interdependency: *"So it was helpful that we did that together, but I think we could also have done that each on his own." (T13Q4)*		
Task novelty	… state that the task is not novel.	… contain elements of what makes the task more or less novel.	… state that the task is novel.
	Example segment for mid novelty: *"Innovative is not the right expression, neither is routine approach. Every student has his own question, (…) and sometimes questions are new, resulting in adaptive coaching."(T8Q5)*		
Task structure	… reveal the task and method are given, but new. The results are also new or open.	… reveal the task and method are given, but the results are open.	… reveal the task, method, and results are given.
	Example segment for high structure: *"We have the assignment to develop a course on the spine; the content as well as the organization. We have received an outline from the curriculum committee, and our task is just to further elaborate on that and turn it into a nine-week course". (T2Q2)*		
Task complexity	… state that the task is not complex.	… contain elements of what makes the task more or less complex.	… state that the task is complex.
	Example segment for high complexity: *"The special thing is that you work with students of different levels, with researchers, with workers from the field, with lecturers. And that makes it very difficult, because everyone has their own rhythm, their own interests, and their own responsibilities." (T16Q3)*		

DATA ANALYSIS

Analysis started with the team learning behavior codes. The perceptions of team learning behavior appeared to vary between the interviewees, which was used as a starting point to categorize the data. We tracked which of the three team learning behaviors were mentioned per team member. Three categories emerged: 1) team members that *only* had segments on sharing; 2) team members with segments on sharing, and either constructive conflict *or* co-construction; and 3) team members with segments on sharing, constructive conflict *and* co-construction. These categories imply a continuum that combines Paavola et al.'s (2004) and Ellström's (2001) conceptualization of learning levels discussed earlier: from sharing/adapting knowledge for routine to creating/developing knowledge (constructive conflict and co-constructing) for innovation. Next, we analyzed how the team members in each of the three established categories perceived their team's psychological safety, efficacy, task, and leadership behaviors, exploring how these perceptions varied within and between the three categories. We then labeled the three categories in terms of three team types: coordinative, adaptive, and integrative teams.

These labels mirrored the main differences between the categories, given the segments' content within each category.

RESULTS

Table 2.3 summarizes the main results categorized by the three team types.

Table 2.3 Summary of the main findings by three team types

Team type	COORDINATIVE (N=6)	ADAPTIVE (N=5)	INTEGRATIVE (N=5)
Team learning behaviors	Sharing	Sharing, and some co-construction *or* constructive conflict	Sharing, constructive conflict, and co-construction
	Responses stopped after the sharing	Seeking consensus, and some modifying or building upon each other after sharing	Integrating differences, analyzing, and synthesizing after sharing; building upon each other; and finishing a discussion
Task perception			
Interdependence	High-level	Mainly high-level	High-level
Novelty	Mainly mid-level	Mid-level	Mainly mid-level
Structure	Mainly high-level	Mainly mid-level	Mainly mid-level
Complexity	Mainly mid-level	Mid-level	Mainly high-level
Vertical team leadership behaviors			
Considering individual needs when dividing tasks	Actively	Actively	Being aware, but not actively intervening
Monitoring performance	Actively on progress and content	Actively on progress	Being aware, but not actively intervening
Shared team leadership behaviors			
Dealing with different possibilities before decision-making by	Harmonizing differences	Discussing differences	Integrating differences
Considering individual needs when dividing tasks and dealing with individual problems	Considering organizational talents, and solving problems individually	Considering preferences, and supporting each other when problems occur	Considering content expertise, and perceiving problems as team problems
Setting working agreements on	Meeting time and agenda	Meeting time and agenda	Meeting time and agenda, and on working processes
Monitoring performance by	Checking agreements	Checking agreements and discussing the content at team level	Checking agreements and discussing the content at team level

TEAM LEARNING BEHAVIOR

The learning behaviors each team member mentioned (sharing, constructive conflict, and/or co-construction) formed the basis for discerning the three team types.

The *coordinative* team type consisted of six team members who only mentioned sharing activities, such as sharing opinions, thoughts, ideas, and experiences. Building upon each other or modifying each other's input did not occur. Their responses suggested they coordinated their knowledge, for example:

> *"Everyone shares loudly. In the beginning it was ill-structured. We've brainstormed." (T3Q20).*

The *adaptive* team type consisted of five team members who reported sharing, as well as either constructive conflict or co-construction. Sharing, and sometimes building upon or modifying each other's input, was mentioned by the team members. Overall, it seemed these team members mainly sought consensus rather than differences, and adapted their knowledge collaboratively, stating, for example:

> *"Yes, there is discussion, in a sense that we talk about that, but I notice that we always find our way through it." (T5Q15)*

The *integrative* team type consisted of five team members who mentioned a combination of sharing, constructive conflict, and co-construction. Their segments reflected integrating differences, and analyzing or synthesizing the shared thoughts, resulting in some kind of temporary agreement, or an agreement to disagree. Their responses indicated they integrated and developed their knowledge, as reflected in this statement:

> *"Everyone shares their opinion. And there are different phases. In a brainstorming phase, all opinions are widespread. After a brainstorming phase, you see that you are able to take the important parts, and to shape that and to come to a shared decision." (T11Q12)*

In addition, there were no differences between the team members on their perceptions of team psychological safety and team efficacy. The team members stated they felt safe enough to speak up (N=15), and stressed that they were capable of achieving the team task together (N=16).

4.2 TASK PERCEPTION

Overall, team members perceived high-level task interdependence (N=14), and mid-level task novelty (N=11). What differed most between the team types were team members' perceptions of task structure and complexity. Within the coordinative team type, almost all team members perceived a high-level structured task (N=4), in contrast to only one within the integrative team type. Just one team member within the coordinative team type perceived task complexity as high-level, in contrast to more than half of the members within the integrative team type (N=3).

TEAM LEADERSHIP BEHAVIORS

Vertical, shared, transformational and transactional leadership behaviors occurred in all team types. However, in-depth content analysis of the coded segments exposed two main differences. Firstly, segments on *vertical leadership* indicated that leaders of coordinative teams were more actively involved, whereas leaders of integrative teams were aware of team processes but did not actively intervene. Secondly, segments on *shared leadership* implied leaders within the coordinative teams were more coordinative and individually focused, whereas in integrative teams the focus was on integration and content. Six key subcodes for team leadership behavior (see Table 2.3) clarify these main differences.

Vertical transformational leadership behaviors concerned "considering individual needs when dividing tasks" (1). Segments within the coordinative team type showed that these team leaders were actively involved in the process and were highly individually focused (N=3). They ensured an equal division of tasks, took all input seriously, and showed that they were committed to each team member:

> *"The team leader ensures that all tasks are equally divided, and that this happens proportionately. It is someone who also somewhat monitors, like: 'You shouldn't do everything, leave some for the others'." (T1Q30)*

Team leaders of the adaptive teams arranged an equal task division by taking each member's planning schedule and energy into account (N=3). In contrast, team members of the integrative team types mentioned their leaders were aware of the team process and individual needs, but did not actively interfere in the process (N=2).

"Monitoring performance" (2) was a key subcode for *vertical transactional leadership behaviors*. Team members within the coordinative team type mentioned that their team leaders monitored the agenda, asked for progress, and took a stand in discussions (N=4). Furthermore, segments within adaptive teams indicated these leaders confronted members on following up team decisions (N=2). Again, team leaders of integrative teams showed the opposite: they monitored, but did not actively intervene in the process or the content (N=1):

> *"Being aware of what everyone does, without meddling in everything." (T2Q31)*

Shared transformational leadership behaviors differed as follows. "Dealing with different possibilities before decision-making" (3) showed members within the coordinative team type harmonized differences (N=3); the adaptive team type discussed differences (N=3); and the integrative team type integrated differences to make a decision together (N=1). "Considering individual needs when dividing tasks and dealing with individual problems" (4) showed that team members within the coordinative team type managed task division by using their own organizational

talents and solved individual problems individually (N=3). The segments within the adaptive team type indicated tasks were divided based on member's preferences, and they supported each other when problems occurred (N=3):

> *"I know that I'm not alone in this. When I say 'I am too busy at the moment, I can't make it', then I know I'll get support." (T5Q32)*

In contrast, the team members within the integrative team type divided tasks based on their own expertise and perceived individual problems as team problems (N=3). Additionally, they initiated process evaluations and collectively monitored the psychological safety.

Shared transactional leadership behaviors concerned two key subcodes. Analyses on "setting working agreements" (5) showed that the team members within the coordinative (N=4) and adaptive team types (N=1) mentioned they focused on arranging agreements on the meeting time and the agenda, whereas team members within the integrative team types also explained they focused on setting working processes agreements (N=2):

> *"We consider the action points, and we say: "Who does what?' Followed by: 'In two weeks this is done, and then we discuss that again in the group'." (T2Q33)*

Finally, "monitoring performance" (6) also differed: interviewees within the coordinative team type said they checked if all team members did what they agreed upon (N=4), whereas the team members within the adaptive (N=3) and integrative team types (N=3) also discussed the content at team level after the individual tasks were carried out:

> *"We divide the tasks, but after that we also discuss what we have done and if we've succeeded. And we also ask: 'Please check if this is in line with the intention'." (T2Q34)*

CONCLUSIONS AND DISCUSSION

This study aims to understand how university teacher teams learn together to deal with their task, and therefore explores the role of team members' perceptions of learning, their task, and leadership behaviors in their team. This resulted in four main findings.

UNIVERSITY TEACHER TEAM LEARNING APPEARS TO BE PRESENT, BUT NOT IN ABUNDANCE

First, the learning behaviors each team member mentioned formed the basis for discerning three team types: coordinative, adaptive, and integrative. The

coordinative and adaptive team types stopped after sharing, sought consensus, and either harmonized (coordinative team type) or adapted (adaptive team type) existing knowledge and practices. In contrast, the integrative team type engaged in constructive conflicts, integrated their differences, and co-constructed new ideas or solutions. This finding aligns with Kwakman's (2003) study among secondary school teachers: the majority of our sample (69%) also preferred just sharing views. Roxå and Mårtensson (2009) found it is important for university teachers to feel safe in order to openly discuss their existing practices. However, our data suggest that psychological safety and team efficacy were perceived as high by all team types. This indicates that experiencing high levels of psychological safety and team efficacy might not be enough to seek controversy for building new knowledge and finding solutions together.

OBSERVING THAT STANDARD METHODS AND SOLUTIONS ARE INADEQUATE

Second, our findings indicate that members who perceived that standard methods and solutions were inadequate to deal with the task, also mentioned constructive conflicts and co-constructions in addition to sharing. Other authors suggest that recognizing such an innovative task feature could form a basis for team members to move beyond sharing and challenge the status quo collaboratively (De Dreu & Weingart, 2003; Ellström, 2001; Paavola et al., 2004). However, our findings also suggest that university teachers do not necessarily recognize such features. Similarly, Roxå and Mårtensson (2009) showed that university teachers tend to shy away from controversial ideas that may cause conflict. This might be all right for a routine task, but Paavola et al. (2004) argued that creating innovative solutions requires more than just sharing.

VERTICAL TEAM LEADERSHIP BEHAVIORS FROM A DISTANCE

Third, teacher team learning behavior seemed to benefit from vertical transformational and vertical transactional leadership behaviors. This finding aligns with Bucic et al. (2010) and Mebane and Galassi (2003) who found that both vertical leadership styles were related to university teacher team learning. Our data further specify this by suggesting that leaders in integrative team types were aware of the process but did not actively interfere. Similarly, Bryman (2007) concluded that effective leaders in higher education empower teams and monitor from a distance.

SHARING INTEGRATIVE AND CONTENT-FOCUSED LEADERSHIP BEHAVIORS

Finally, our findings further elaborate earlier claims that shared leadership in general is suited to teacher teams, by suggesting that instead of smoothing out

differences and checking tasks together, discussing and integrating differences and content at the team level might be supportive for team learning. Moreover, regarding discussions and solving individual problems, members within the integrative team type were focused on the team as a whole, whereas the coordinative and adaptive team types tended to keep such activities on an individual level. Similarly, Yukl (2009) argued that leadership behaviors that focus on connecting team members stimulate team learning behaviors.

LIMITATIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

The present study is explorative and small-scale. Nevertheless, it offers rich, in-depth information suggesting that university teacher team's learning behaviors vary, and that task perception and different team leadership behaviors play a role in that regard. Future research is necessary to establish how to further investigate the influence of team leadership's focus on team learning, beyond the traditional level of style and source. Specifically, our findings recommend developing further understanding of how team learning behavior in teams dealing with open tasks with unconventional methods and outcomes are stimulated by leadership behaviors from a distance, and by sharing a focus on content and integration. These leadership behaviors were also identified in integrative team types; perhaps integrative teams develop, accept or foster such behaviors. A longitudinal study could provide more understanding on how leadership can influence coordinative teams into becoming adaptive or integrative.[1] Our findings imply that leadership plays a role in encouraging university teachers to leave their comfort zone to seek controversy and challenge the status quo together in teams, and to subsequently co-construct new knowledge and practices for sustaining higher education's added value.

[1] We thank an anonymous reviewer for this suggestion.

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3 WHEN LEADERSHIP POWERS TEAM LEARNING: A META-ANALYSIS

ABSTRACT

Team learning behavior is found to be one of the most effective team processes, since learning behavior at the team level (e.g., sharing, discussing, and reflecting on knowledge and actions) enables teams to adapt existing or develop new knowledge. Team leadership behavior is considered a critical accelerant for creating conditions that are essential to engage in team learning behavior, such as a safe environment. Yet despite the growing amount of research in this field, this relationship remains unclear. Meta-analytic techniques were used to examine when team leadership behaviors power team learning behavior and how the task type moderates that relationship. Forty-three empirical studies reporting 92 effect sizes were synthesized. Analyses show that team leadership behavior explains 18% of the variance in team learning behavior. Furthermore, results indicate that person-focused leaders foster team learning for both adaptive and developmental tasks, whereas task-focused leaders influence team learning for adaptive tasks only.

THIS CHAPTER IS BASED ON:

Koeslag-Kreunen, M., Van den Bossche, P., Hoven, M., Van der Klink, M. R., & Gijselaers, W. H. (2018). When leadership powers team learning: A meta-analysis. *Small Group Research, 49*(4), 475-513. doi:10.1177/ 1046496418764824

For more than two decades, research and practice have shown that teams are essential for various organizations in adapting to the ever-changing, competitive, and increasingly complex working environment (Kozlowski & Ilgen, 2006). Teams are defined as "a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems" (Cohen & Bailey, 1997, p. 241). Salas, Goodwin, and Burke (2009) reasoned that a team approach allows professionals to integrate their different ideas, viewpoints, and expertise. For this reason, teams have the potential to adapt to changing situations and to improve knowledge, products, and services successfully – and even more thoroughly than individuals can (Kozlowski & Ilgen, 2006).

Team learning behavior is forwarded as one of the most effective team processes through which teams are able to adapt to and improve knowledge successfully (Mathieu, Maynard, Rapp, & Gilson, 2008). This behavior is defined as "an ongoing process of reflection and action characterized by asking questions, seeking feedback, experimenting, reflecting on results, and discussing errors or unexpected outcomes of actions" (Edmondson, 1999, p. 353). In this definition, team learning behavior is not perceived as an outcome of interactions but as collective discourse activities that teams undertake to yield new insight into a problem (Edmondson, Dillon, & Roloff, 2007). Van den Bossche, Gijselaers, Segers, and Kirschner (2006) showed that collective discourse activities such as the process of building on each other's input (i.e., co-construction) develop mutually shared cognitions, and can therefore be observed as examples of team learning behavior. It has been shown that such team learning behaviors enable teams to improve existing or develop new techniques, approaches, products, or knowledge of a high quality in a short time (Sessa & London, 2008).

At the same time, research has also showed that team members do not engage in team learning behavior automatically, because it implies running a risk. For example, differences in status can lead to obstructive domination by members with more authority (Brooks, 1994), and members can experience a cognitive overload when facing unstructured tasks (De Dreu & Weingart, 2003). For this reason, it is argued that engaging in team learning behavior needs to be encouraged through team leadership behavior (e.g., Van der Haar, Koeslag-Kreunen, Euwe, & Segers, 2017). Team leadership behavior is defined as "the process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives" (Yukl, 2010, p. 8). There is an increasing volume of research on how team leadership behavior can support team learning behavior (Decuyper, Dochy, & Van den Bossche, 2010). For instance, Wong and Tjosvold (2010) found that team leaders who emphasize building social relationships facilitated members to overcome feeling insecure in expressing opposing ideas. In addition, Somech (2006) revealed

that team leaders who defined team goals provided structure and inspired team reflexivity.

However, despite this growing amount of evidence, it remains unclear how leadership behavior best supports team learning behavior. First, it appears that studies on team leadership behavior rarely integrate multiple sources of leadership behavior; even when such studies are available, they relate leadership to team performance rather than to team learning (Burke et al., 2006). Team leadership behavior can stem from two sources: "the behavior of the appointed team leader", which is referred to as the the vertical source, and "the distributed influence from within the team, which is referred to as the shared source (Pearce and Sims, 2002, p. 172). Traditionally, leadership studies have focused exclusively on the vertical source and provided abundant proof of the significant role of the vertical source (e.g., Burke et al., 2006). More recently, the shared source has been gaining attention (Nicolaides et al., 2014). It is argued that the distribution of leadership among team members fits the contexts in which teams operate, such as highly complex tasks for which single leaders simply cannot provide all the answers (Pearce & Barkus, 2004). Pearce and Sims (2002) showed that both sources coexist among teams. Evidence on how both sources are related to team learning behaviors is absent, since most studies include only one source (mainly the vertical source) or relate both sources exclusively to team performance (e.g., Pearce & Sims, 2002; Nicolaides et al., 2014).

Second, research on how multiple styles of leadership behavior relate to team learning behavior is limited (Zaccaro, Ely, & Shuffler, 2008). Burke et al. (2006) distinghuished two sets of leadership behavioral styles: person-focused styles (such as inspiring team members) and task-focused styles (such as setting team goals). Pearce and Sims (2002) showed that these two behavioral styles can stem from both the appointed team leader (vertical) and the team members (shared). However, studies that integrate both behavioral styles are scarce, or they relate both styles to team performance rather than to team learning behavior (e.g., Pearce & Sims, 2002).

Third and final, an empirical foundation is required for the suggestion that the relationship between team leadership behavior and team learning behavior is dependent on the specific team task (Edmondson et al., 2007). London (2014) suggested that the promotion of learning in teams dealing with adaptive tasks, such as production, requires task-focused leadership behaviors in order to reinforce exploitation. In addition, London (2014) proposed that learning behavior in teams dealing with developmental tasks, such as innovation, is supported by person-focused behavior in order to promote creativity. Regardless, studies on team leadership rarely integrate multiple leadership styles and sources with team learning behavior, resulting in a lack of evidence for these hypotheses (Edmondson et al., 2007).

The present meta-analysis studies when leadership behavior best supports team learning behavior. For this purpose, we elaborate and extend the preliminary

meta-analyses on team leadership behavior by Burke et al. (2006) and Nicolaides et al. (2014). Burke et al. (2006) focused solely on the vertical source of leadership. Meanwhile, research that examines the influence of team leadership behavior on team learning behavior has increased, which calls for an updated synthesis. In addition, Nicolaides et al. (2014) compared the influence of shared and vertical leadership on team performance, but they did not analyze the influence of both sources on team learning behavior, nor did they differentiate between specific styles of leadership behavior.

We aim to contribute to the current literature by focusing on three issues. First, this study examines the overall effect of team leadership behavior on team learning behavior. Second, we will calculate the effect of different sources and styles of team leadership behaviors (i.e., vertical, shared, person-focused, and task-focused team leadership behavior) on team learning behavior. Third, we aim to provide new knowledge on how team task (i.e., adaptive and developmental) moderates the effect of each source and style of team leadership behavior on team learning behavior. Although these research questions might be assessed by synthesizing solely quantitative studies, we will also include qualitative studies. Borman and Grigg (2009) argued that combining quantitative and qualitative studies in meta-analyses can advance the interpretation of the findings, because it supports a deeper understanding of how calculated effects may vary under certain conditions. Paterson, Thorne, Canam, and Jillings (2001) reasoned that this is especially valuable when studying complex social relationships, such as team learning and leadership. To this end, we will meta-analyze quantitative and qualitative studies of the influence that team leadership behavior has on team learning behavior. This meta-analysis is based on the conceptual model and hypotheses presented in Figure 3.1, which will be discussed next.

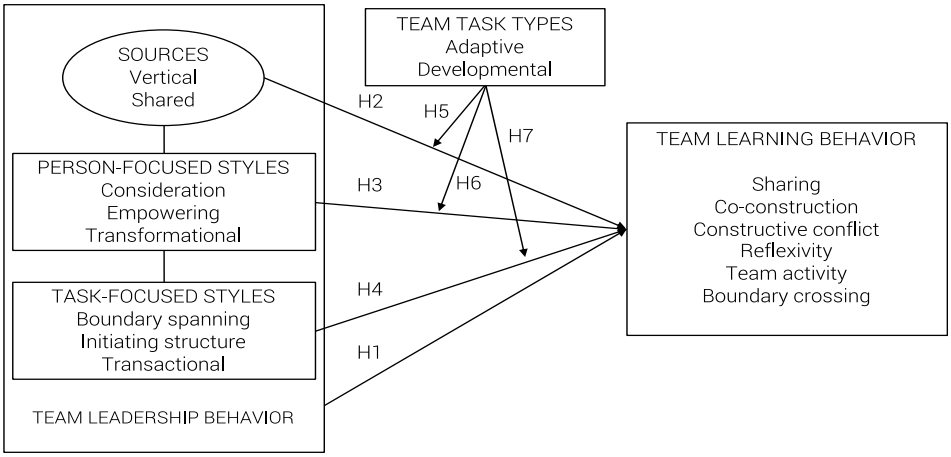

Figure 3.1 Hypothesized relationships between team leadership behaviors, team task types and team learning behaviors

TEAM LEARNING BEHAVIOR

Senge (1990) was one of the earliest to describe team learning as fundamental for organizational change. The importance of team learning has since been demonstrated in research at an ever-increasing rate. Edmondson et al. (2007) identified three leading concepts of team learning in research: (a) team learning as performance improvement (e.g., a change in knowledge; Ellis et al., 2003), (b) team learning as task mastery (e.g., the ability to coordinate team members' knowledge to accomplish tasks; Wilson, Goodman, & Cronin, 2007), (c) and team learning as a process (e.g., collectively sharing, discussing, and reflecting; Edmondson, 1999). The present meta-analysis conceptualizes team learning as a process. In this respect, we make a clear distinction between team processes and team outcomes. Widely used input-process-output models to analyze teams and team performance show that inputs (e.g., composition and leadership) to the team have an influence on team processes, which in turn lead to team outcomes, such as performance and viability (Day, Gronn, & Salas, 2004). We adhere to the view that performance improvement and task mastery are outcomes of team processes, because they develop from behavioral learning processes within the team (Day et al., 2004; Decuyper et al., 2010).

This meta-analysis conceives of team learning as learning processes at the team level (e.g., Mathieu et al., 2008). Kozlowski and Ilgen (2006) argued that although team learning is based on individual learning, it exceeds the sum of the individual learning of team members. Team learning processes occur when individual knowledge and experiences are being shared, discussed, and reflected on at the team level (Kozlowski & Ilgen, 2006). These processes are seen as examples of team learning behaviors, because they build shared cognitions that enable teams to modify ideas, change protocols, and develop new knowledge together (Van den Bossche et al., 2006). Decuyper et al. (2010) identified six team learning behaviors in a comprehensive review: (a) sharing, (b) co-construction, (c) constructive conflict, (d) reflexivity, (e) activity, and (f) boundary crossing. *Sharing* refers to sharing each other's ideas, knowledge, expertise, and opinions through interaction and communication (Faraj & Sproull, 2000). Many scholars have found that sharing determines team performance (e.g., Lee, Lee, & Park, 2014; Srivastava, Bartol, & Locke, 2006). *Co-construction* is defined as building on each other, refining statements, and modifying previous ideas (Raes et al., 2012). Van den Bossche et al. (2006) have shown that co-construction leads to adapted or new meaning and knowledge. During sharing and co-construction, discussions and conflicts may occur as a result of different opinions and opposing interpretations. These *conflicts* become *constructive* when team members act on these differences by negotiating the divergences and integrating opposed ideas into an agreement – or an agreement to disagree (Van den Bossche et al., 2006). Research shows that higher levels of constructive conflict relate to better team performance (Van der Haar et al., 2017). *Team reflexivity* is

defined as "the extent to which team members collectively reflect upon the team's objectives, strategies and processes" (West, 1996, p. 559). Research shows that team reflexivity positively affects team performance (Hoegl & Parboteeah, 2006). *Team activity* is defined as "learning by doing" (Decuyper et al., 2010, p. 118), such as trying out solutions (Kasl, Marsick, & Dechant, 1997). Team activity enables team members to transfer ideas and expertise that is non-explicit or non-consciously present; for example because it is interated into specialized skills (Eraut, 2000). *Boundary crossing* is defined as "seeking or giving information, views, and ideas through interaction with other individuals or units" (Kasl et al., 1997, p. 230). Research shows that boundary crossing improves team performance because it yields other perspectives on the problem (Liu, Schuler, & Zhang, 2013).

In sum, the process of team learning behavior can help to achieve successful team performance, such as solving problems and team viability (Sessa & London, 2008). However, engaging in team learning behavior requires support, because it does not just happen by itself (Zaccaro et al., 2008). Each team learning behavior outlined above implies taking a risk. For example, sharing personal ideas makes people vulnerable (Mayer, Davis, & Schoorman, 1995), co-constructing requires courage to modify known protocols (Edmondson, 2003b), seeking controversy through constructive conflicts implies overcoming natural habits of harmonizing differences (Koeslag-Kreunen, Van der Klink, Van den Bossche, & Gijselaers, 2018), expressing negative feedback during team reflexivity can harm team processes (Kluger & DeNisi, 1996), team activity can lead to ineffective socialization (Ostroff & Kozlowski, 2006), and boundary crossing can disrupt team performance through negative feedback (Ancona & Caldwell, 1992). These examples indicate that engaging in team learning behavior is risky and, as a result, requires support. It is argued that team leadership behavior can support teams in taking that risk (Zaccaro et al., 2008). Edmondson (2003a) discussed that team leaders can facilitate engaging in team learning behaviors by, for instance, expressing their own imperfections, tolerating failure, organizing reflection, and setting valuable team goals. In addition, Hoch (2014) argued that distributing such team leadership behaviors among team members can overcome obstructive power differences and support members in providing their unique information. Based on these arguments, we propose our first hypothesis:

> *Hypothesis 1. Team leadership behavior explains significant variance in team learning behavior.*

SOURCES OF TEAM LEADERSHIP BEHAVIOR TO STIMULATE TEAM LEARNING BEHAVIOR

We distinguish two sources from which team leadership behavior can originate in order to influence team learning behavior: the vertical source and the shared source of leadership. *Vertical team leadership behavior* is defined as leadership

behavior that stems from a single leader who is formally appointed to lead the team through a hierarchical influence on the team (Pearce & Barkus, 2004). *Shared team leadership behavior* is attested when team members are "engaged in the leadership of the team and are not hesitant to influence and guide their fellow team members in an effort to maximize the potential of the team as a whole" (Pearce & Barkus, 2004, p. 48). It is argued that both the vertical and the shared source of team leadership behavior have an influence on team learning behavior. Burke et al. (2006) observed that formal leaders who provide feedback and offer consultation foster knowledge sharing. These vertical team leadership behaviors improve team members' self-confidence and courage to speak up (Edmondson, 1999). When power is shared, team members share team leadership behaviors (Pearce & Barkus, 2004), which enables them to interact freely and equally without power differences and resulting in richer interactions (Brooks, 1994). These arguments suggest that both sources stimulate team learning, as formulated in our second hypothesis:

> *Hypothesis 2. Vertical and shared team leadership behavior both have a significant effect on team learning behavior.*

STYLES OF TEAM LEADERSHIP BEHAVIOR TO STIMULATE TEAM LEARNING BBEHAVIOR

To understand when leadership is functional in teams, research usually observes team leadership from the behavioral perspective (Burke et al., 2006). Burke et al. (2006) distinguished two main behavioral styles: person-focused and task-focused team leadership behaviors. To be clear, these behaviors can stem from both vertical and shared team leadership sources (Pearce & Sims, 2002).

Person-focused team leadership behaviors are behaviors that encourage communication, support self-management, and challenge team members to move beyond their self-interest (Burke et al., 2006). Consideration, empowering, and transformational leadership are perceived as specific person-focused leadership behaviors (Burke et al., 2006). *Consideration* means building a positive climate for cooperation and open communication, and emphasizing the relationships and wellbeing of team members (Carmeli, Tishler, & Edmondson, 2012). It is argued that consideration supports team learning behavior, because it sets the right atmosphere (Somech, 2006) and promotes positive relationships (Hirst et al., 2004). *Empowering* team leadership means actively developing the self-leadership skills of the team (Burke et al., 2006). Empowering team leadership is also referred to as "team coaching" (e.g., to encourage teams and being available for consultation; Edmondson, 1999) or "participative leadership" (i.e., sharing influence; Somech, 2006). Srivastava et al. (2006) showed that empowering leadership encouraged team members to share their knowledge, because members found that this situation was crucial to making decisions. *Transformational* team leadership is defined as helping team members to move beyond their self-interest by challenging

them and by stimulating creativity, in their efforts to solve problems (Bass & Avolio, 1994). According to Bass and Avolio (1994), transformational leaders are charismatic, consider individual concerns, challenge members to break with the status quo and seek alternatives, and set a compelling vision and purpose. Schippers, Den Hartog, Koopman and Van Knippenberg (2008) found that transformational leaders positively influence team reflexivity; for example by encouraging members to reflect on their daily routines. In sum, it is argued that person-focused styles of leadership behavior foster team learning behavior through encouraging communication, supporting self-management, and moving beyond self-interest, as summarized in our third hypothesis:

> *Hypothesis 3. Person-focused styles of team leadership behavior (i.e., consideration, empowering, and transformational) are positively related to team learning behaviors.*

Task-focused team leadership behaviors emphasize the task by providing task information, structuring the task, and monitoring team performance (Burke et al., 2006). Burke et al. (2006) included boundary spanning, initiating structure, and transactional leadership as specific task-focused leadership behaviors. *Boundary spanning* means scanning the environment for new information, networking, and negotiating teams' resources (Ancona & Caldwell, 1992). Burke et al. (2006) argued that boundary spanning activities direct teams toward task accomplishment and guide team tasks according to the available material resources and organizational strategies. Edmondson (2003b) proposed that boundary spanning activities by team leaders stimulate the team's own boundary crossing, because team leaders have easier access to external networks and set an example that motivates members to seek external information themselves. *Initiating structure* means defining a team's tasks, working methods, goals, and outcomes (Døving & Martín-Rubio, 2013). Burke et al. (2006) distinguished directive (i.e., organizing processes through methods and outcomes) and autocratic leadership (i.e., decision-making without involving team members) as two forms of initiating structure. Somech (2006) showed that directive leaders enhance team reflexivity, because defining team goals inspires members to reflect on those goals and encourages members to criticize each other's work. *Transactional* team leadership behaviors focus on task agreements, the required facilities, and the rewards or punishments for achieving them (Bass & Avolio, 1994). This behavior is also represented in a more passive way by only intervening when problems occur (Burke et al. 2006). Ashauer and Macan (2013) argued that focusing on the team's task and performance can motivate members to show their competence for the task, thereby encouraging them to engage in team learning behaviors. In sum, it is suggested that task-focused styles of leadership behavior foster team learning behavior by providing task information, structuring, and monitoring, as set out in our fourth hypothesis:

Hypothesis 4. Task-focused styles of team leadership behavior (i.e., boundary spanning, initiating structure, and transactional) are positively related to team learning behaviors.

TEAM TASK TYPE AS A MODERATOR

It has been argued that the relationship between team leadership behavior and team learning behavior is influenced by the team's task (London, 2014). Ellström (2001) argued that tasks vary in their level of structure and novelty. We categorize this variation by distinguishing between two types of team tasks: adaptive and developmental tasks. *Adaptive tasks* are prescribed, medium to highly structured, and contain some new elements (Devine, 2002, Ellström, 2001). Typical examples of team activities for adaptive tasks are executing, coordinating, service applying, training, caring, operating, and producing (Cohen & Bailey, 1997; Devine, 2002). By contrast, *developmental tasks* are not prescribed, medium to minimally structured, and contain many new elements (Devine, 2002, Ellström, 2001). Typical team activities for developmental tasks are improving, designing, researching, dissolving, and creating (Cohen & Bailey, 1997; Devine, 2002).

Kostopoulos and Bozionelos (2011) showed that the effective behavioral processes for team learning appear to be different between the two task types. For adaptive tasks, teams adapt their knowledge to the new elements in order to be effective; as in the case of a medical team following a known protocol in a new situation. These teams can rely on existing knowledge, because they can build on known methods and predict results to some extent. By contrast, Kostopoulos and Bozionelos (2011) showed that developmental tasks require the development of new knowledge in order to be effective, because they work with unknown methods and open results; as in the case of a product development team designing an innovative product. Based on these differences, Vera and Crossan (2004) suggested that the effective team leadership behavior in order to support team learning behavior is also different for both team types.

First, there might be a difference between the benefits of the vertical and the shared source of team leadership behavior for each task type. For example, Van der Haar et al. (2017) studied command-and-control teams who needed to follow strict protocols to adapt to the situation at hand. They showed that vertical team leadership behavior supported team learning behavior by actively clarifying and summarizing team members' inputs. It is suggested that team learning behavior for teams dealing with less-structured tasks is supported by shared team leadership behavior. In these developmental tasks team members can not rely on existing protocols (Kostopoulos & Bozionelos, 2011). It is argued that this increases team members' interdependence when teams seek alternative solutions to questions for which single leaders do not have the answers (Day et al., 2004). Therefore, shared team leadership might be more beneficial for developmental team tasks

than vertical team leadership behavior (Pearce & Barkus, 2004). As a result, we propose our fifth hypothesis:

> *Hypothesis 5a. The effect of the source of team leadership behavior on team learning behavior is moderated by the task type in such a way that vertical team leadership behavior is more strongly related to team learning behavior in teams facing adaptive tasks than in teams facing developmental tasks.*
>
> *Hypothesis 5b. The effect of the source of team leadership behavior on team learning behavior is moderated by the task type in such a way that shared team leadership behavior is more strongly related to team learning behavior in teams facing developmental tasks than in teams facing adaptive tasks.*

Second, there might be a difference between the benefits of person- and task-focused leadership styles for each task type. Person-focused behaviors may support learning behavior particularly in teams dealing with developmental tasks (London, 2014). These teams face high levels of uncertainty because they cannot rely on routines and, therefore, need to be even more creative. It is argued that person-focused team leadership behaviors facilitate team learning behavior by building a positive climate for communication and challenging members to disrupt their routines (Edmondson, 2003b). Ashauer and Macan (2013) conducted an experiment in teams with developmental tasks and found that teams with person-focused leaders showed more learning behaviors than teams lead by task-focused leaders. The person-focused leaders supported team learning behavior because they emphasized the importance of developing strategies for improvement, while the task-focused leaders concentrated on team outcomes. For this reason, we propose the following in our sixth hypothesis:

> *Hypothesis 6. Person-focused team leadership is more strongly related to team learning behavior in teams facing developmental tasks than in teams facing adaptive tasks.*

London (2014) suggested that the learning behavior in teams facing adaptive tasks might be supported by task-focused leadership behavior. These leadership behaviors reinforce exploitation and production because they structure processes by applying known protocols and structures, as well as by monitoring and rewarding outcomes, which is possible when tasks are more structured from the beginning (London, 2014). Based on these arguments, we propose the following in our seventh and final hypothesis:

> *Hypothesis 7. Task-focused team leadership is more strongly related to team learning behavior in teams facing adaptive tasks than in teams facing developmental tasks.*

METHOD

MAIN LITERATURE SEARCH

Figure 3.2 presents the flowchart for identified and included studies, and contains several approaches to identifying relevant published and unpublished empirical studies (White, 2009). The main search was conducted in February 2017 and included nine different electronic bibliographic databases, which together covered multiple disciplines (e.g., economics, education, management, medicine, psychology, and sociology) and encompassed different source types (e.g., academic journals, dissertations and books). We used the following search terms (searching "all fields" and "all years"): "team" combined with "team learning" or "sharing" or "co-construction" or "constructive conflict" or "boundary crossing" or "team reflexivity" or "team activity", combined with "team leadership" or "leadership". This search yielded an initial output of 2,277 references (Web of Science: 815; Business Source Premier: 765; CINAHL: 57; Econlit: 10; ERIC: 204; Psych and Behavioral Sciences Collection: 35; Psycharticles: 4; PsychINFO: 317; and SocINDEX: 70) that were imported in Endnote and screened for duplicates, resulting in 1,968 unique studies.

Subsequently, papers not yet published were identified by manually searching conference presentations between 2013 and 2017 for the Academy of Management (AoM), European Association for Research on Learning and Instruction (EARLI), European Association of Work and Organizational Psychology (EAWOP) and the Interdisciplinary Network for Group Research (INGRoup), using the same search words. Five relevant presentations were found (1 AoM, 3 INGRoup, 1 EAWOP), of which four papers (three of which were published) were received upon request, and one extra unique paper was attached by one of the contacted authors. Additionally, INGRoup's network was invited to send additional unpublished work, resulting in no further potential studies. Accordingly, this manual search identified six additional studies, resulting in a total of 1,974 identified studies.

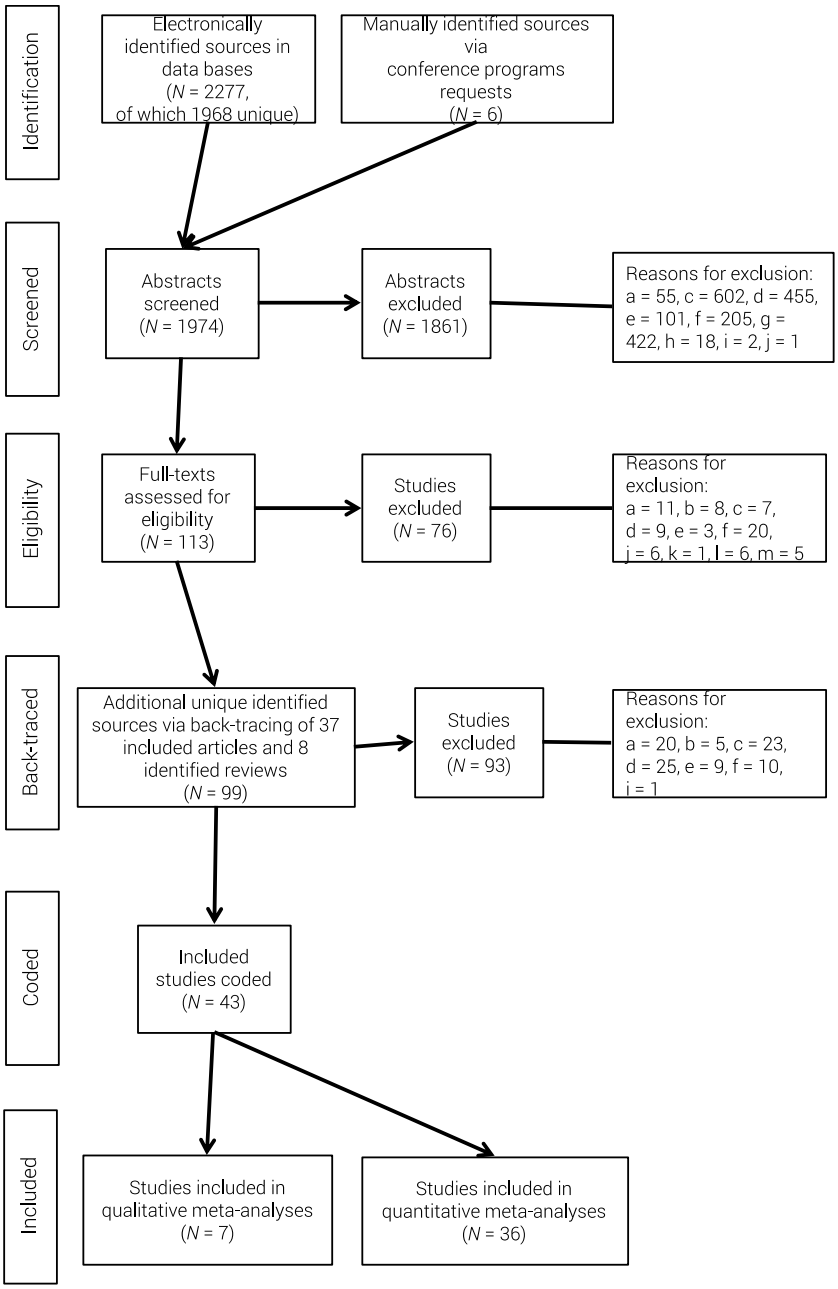

Figure 3.2 Flowchart of identified and included studies

Note. Exclusion criteria: a) Non-empirical; b) Review (used for back-tracing); c) No team studied (e.g. groups, communities, networks); d) No team learning as defined examined; e) No leadership as defined studied; f) Influence of leadership on team learning was not studied; g) News item; h) Empty record; i) Non-available source; j) Non relevant conference abstract; k) Non-English; l) Data also used in other publication(s); m) Data not aggregated on team level.

SELECTION CRITERIA

Qualitative and quantitative studies were included in a meta-analysis (White, 2009). Criteria for exclusion were: (a) non-empirical; (b) review article; (c) no team(s) involved[1] (e.g., communities, groups, staff, firms, individuals, followers, minorities, organizations, networks, collaborations); (d) no involvement of or no fit to the definition of team learning, sharing, co-construction, constructive conflict, reflexivity, activity and/or boundary crossing (team processes/outcomes such as creativity, effectiveness, mental models, innovative behavior, problem solving, discourse, conflict, culture, dynamics, team building, collaboration, commitment were excluded); (e) no involvement of leadership or team leadership; (f) no empirical analysis of the influence of (team) leadership on team learning; (g) news items; (h) empty records; (i) non-available sources; (j) conference abstracts found in the first approach, because these were detected in the second approach; and (k) non-English language used. Next, it appeared that some studies reported the same sample (l). For each case, one study was included to maintain independency (favoring: aggregation on team level; more detailed information; a scientific instead of a practical article; and a peer-reviewed article instead of a dissertation). Lastly, five studies did not aggregate data on team level (m).[2]

LITERATURE SELECTION PROCESS

The selection criteria were applied during three selection phases: (1) abstract screening of the 1,974 studies identified (1,861 sources excluded), (2) assessing full-text eligibility (76 sources excluded), and (3) back-tracing (93 sources excluded), as follows. First, the 1,974 abstracts were screened (White, 2009). In case of doubt, the abstract was included. Three authors independently reviewed 10 abstracts to test the reliability of this screening process. The inter-rater agreement on inclusion/exclusion and the selection criteria was very high (90%). Differences were solved via consensus. This process resulted in 113 selected references. Second, the 113 full texts were read and assessed for eligibility (White, 2009). Fifteen studies were double-blind coded for reliability testing. Again, inter-rater agreement on the criteria was very high (94%). Consensus resolved uncertainties and

[1] We only included teams and no other forms of collaboration to facilitate comparison of the studies. We followed Cohen and Bailey's (1997, p. 241) definition of teams, in which members are task interdependent and share outcome responsibility. These characteristics distinguish teams from other forms of collaboration (e.g., Katzenbach & Smith, 1993; Salas, Burke, & Cannon-Bowers, 2000). Consequently, all included studies examined one comparable form of collaboration, namely teams.

[2] The team constructs in our theoretical framework represent a 'composition model' (Van Mierlo, Vermunt, & Rutte, 2008), meaning individual data on a team construct are nested in the team level of that construct. For example, team members' individual observations of team reflexivity are interdependent and related to the team level of reflexivity. Yet, data points need to be independent for statistical analysis. As a result, measuring team reflexivity is only meaningful when individual observations of reflexivity are aggregated on team level (James, 1982). Therefore, studies that did not aggregate their individual data on a team construct at team level were excluded.

differences. This effort resulted in the inclusion of 37 studies. Third, to ensure all relevant studies were detected, we conducted the back-tracing method (White, 2009). For this, we manually back-traced the references used in the conceptual models of the 8 identified reviews in the main search and the 37 included sources. In total, 99 unique additional references were found, of which 6 met the selection criteria. In conclusion, 43 studies were included in the sample. Figure 3.2 shows the exclusion reasons per selection phase.

SAMPLE

In total, 43 empirical studies were meta-analyzed, of which 36 quantitative that yielded 92 effect sizes, and 7 qualitative. These studies were conducted between 1994 and 2017 (2000 and earlier: $N = 3$; 2001 thru 2005: $N = 3$; 2006 thru 2010: $N = 9$; 2011 thru 2015: $N = 19$; 2016[3] thru 2017: $N = 8$). One paper was in preparation for submission (presented at a conference in 2015) and one paper was under review. Sample sizes per quantitative study ranged from 28 to 156 teams ($M = 73.27$, $SD = 37.37$), and per qualitative study 1 to 16 teams ($M = 4.43$, $SD = 5.19$). Their examined teams had between 3 and 21.60 members ($M = 6.85$, $SD = 3.78$, missing = 2 studies). 17 Studies reported the team's tenure, with a range from immediate (ad hoc teams) till 10.2 years ($M = 2.72$ years, $SD = 2.72$ years). Table 3.1 displays the multidisciplinary nature and variety of our sample: including various contexts (e.g., high-tech and IT companies, service industries, health care and banking sectors), and various team types (e.g., medical teams, management teams and project teams).

CODING PROCESS

The included studies were systematically coded with the use of a coding scheme, with deductive (based on the theoretical framework) and inductive (refining the codes based on the description and measurement found in each study) categories (Wilson, 2009). Table 3.1 displays the coded 43 references of the final sample.

The coding process contained three judgments. First, coding team learning and team leadership was based on the used definition and instruments (e.g., items or coding schemes). If the study integrated three or more team learning behaviors, the code "team learning" was applied, otherwise the one or two team learning behaviors were coded as such. Second, if the examined items represented slightly other or more team leadership behaviors than the definition used in the study, the examined and most suitable code of team leadership was chosen. Third, coding of the task type was based on the description of the sample in the method section of the study. Two authors coded all studies, of which 10 double blind. Inter-rater agreement per code was high (70–80%). Coding team leadership behavior on 15

[3] Of which one paper was an Epub ahead of print in 2016 and got published in 2018.

studies in two rounds resulted in an agreement of 100%. The discussion of differences and uncertainties completed the coding scheme.

QUANTITATIVE META-ANALYTIC TECHNIQUES

The reported correlation coefficient Pearson's *r* (accompanied by the sample size) served as the effect size index of the influence of team leadership behavior(s) on team learning behavior (Borenstein, Hedges, Higgins, & Rothstein, 2009). Following the example of Burke et al. (2006), meta-analyses were performed at three levels (e.g., Borenstein et al., 2009): (a) random overall effect of team leadership behavior (testing H1), (b) subgroup effects of different team leadership behaviors (testing H2, H3, H4), and (c) moderator effect of task types (testing H5, H6, H7). For level 1 and 2 a random-effects model method was used assuming the effect sizes in each study varies randomly (Field & Gillet, 2010). Random-effect models compare each scores between and within the subgroups, and balances weights and makes large studies less dominant (Hunter & Schimdt, 2004). We hypothesized that the observed total relative variance in the studies was due to heterogeneity of (between and within) the studies, for which an $I^2 > 75\%$ is considered large (Borenstein et al., 2009). A significant heterogeneity tested validity of continuing the analysis to find reasons for the (expected) variance. For level 3, we used a subgroup meta-analytical approach to conduct this moderator analysis (Cortina, 2003). Task type served as a dichotomous variable (i.e. adaptive versus developmental) to calculate its moderation effect on the relationship between team leadership behavior and team learning behavior. We examined the (overall) moderator-effect of task type across leadership styles, and the moderator effect of task type per leadership style. We applied a mixed-effect model for these moderator analyses (Borenstein et al., 2009). A random-effects model within subgroups (based on significant heterogeneity tests for allowing random effects within subgroups) was used to calculate the effect of leadership on team learning within subgroups. Next, the *Q*-test (Hedges & Olkin, 1985) within the fixed-effect model was executed to calculate the magnitude of the differences across task types.

Computations were performed using the software program Comprehensive Meta Analysis (CMA) version 3. All raw correlations *r* were first transformed into a Fisher's *z* to stabilize variance (for $N > 20$) by correcting for standard deviations and sample sizes (Hedges, 2009). Then, they were transformed back into an *r* using the formula (i.e. FISHER.INV in Excel) suggested by Borenstein et al. (2009) to present and interpret the data (e.g., Burke et al. 2006). For effects $r = .10$ explaining 1% of the variance is small; $r = .30$ explaining 9% of the variance is moderate, and $r = .50$ explaining 25% of the variance is large. File-drawer analyses were computed to deal with publication bias caused by the possibility that significant findings are favored for publication. Therefore, a fail-safe *N* was calculated indicating the number of unreported studies with a mean effect of zero needed to make the calculated effect size insignificant (Rosenthal, 1979).

Table 3.1 Overview of the coded references.

Quantitative studies (N = 36)			Team leadership behavior				TLB	Task and team type		Context
			Vertical			Shared				
Study (year)	r	N	Person	Task	LF			A	D	
Anselmann and Mulder (2017)*	0.38	32	TF	-	-	-	SH, RE	1	-	Social and health sector
Ashauer and Macan (2013)***	0.36	23	TF		-	-	TL	-	4	University students
Ashauer and Macan (2013)***	0.05	23	-	TA	-	-	TL	-	4	University students
Bai et al. (2016)	0.62	78	TF	-	-	-	SH	-	-	Business school students
Carmeli et al. (2012)	-0.01	77	CO	-	-	-	RE	2	-	Various industries
Carmeli and Paulus (2015)	0.60	77	TF	-	-	-	SH	2	-	High- and low-tech companies
Chuang et al. (2016)*	0.22	162	EM	-	-	-	BC, SH	-	4	Information technology industry
Dong et al. (2017)	0.38	43	TF	-	-	-	SH	-	4	High-tech companies
Døving and Martin-Rubio (2013)	0.62	68	CO	-	-	-	TL	1	-	Commercial banking
Døving and Martin-Rubio (2013)	0.69	68	-	IS	-	-	TL	1	-	Commercial banking
Dufresne (2007)	0.11	40	TF	-	-	-	SH	3	-	Anesthesiologists' training center
Dufresne (2007)	-0.08	40	-	TA	-	-	SH	3	-	Anesthesiologists' training center
Edmondson (1999)	0.63	53	EM	-	-	-	TL	1	4	Office furniture manufacturer
Gibson and Vermeulen (2003)	0.63	156	EM	-	-	-	TL	1	4	Medical products industry
Gu et al. (2018)	0.44	53	-	-	-	DEN	SH	1	4	Various industries
Hirst et al. (2004)*****	0.38	48	CO	-	-	-	RE	-	4	R&D organizations
Hoch (2014)	0.23	46	-	-	-	TF, TA	SH	1	-	Service and training organizations
Hoegl and Parboteeah (2006)	0.41	145	-	-	-	CO	RE	-	4	Software development firm
Hoegl and Parboteeah (2006)	0.31	145	-	-	-	IS	RE	-	4	Software development firm
Jiang et al. (2015)	0.47	60	TF	-	-	-	SH	-	4	High-tech industry
Lee et al. (2010)	0.67	34	TF	-	-	-	SH	-	4	IT services in engineering
Lee et al. (2014)****	0.36	82	EM	-	-	-	SH	-	4	IT services and systems
Lee et al. (2015)	0.78	40	-	-	-	DEN	SH	-	4	University students in IT

Quantitative studies (N = 36)			Team leadership behavior				TLB	Task and team type		Context
			Vertical			Shared				
Study (year)	r	N	Person	Task	LF			A	D	
Li and Zhang (2016)	0.66	62	EM	-	-	-	TL	-	4	High-tech companies
Liu et al. (2013)*	0.12	80	-	BS	-	-	BC, TL	-	4	High-tech companies
Liu et al. (2014)	0.69	50	-	-	-	DEN	TL	1	4	High-tech companies
Lyubovnikova et al. (2015)	0.52	53	TF	-	-	-	RE	1	-	Energy and non-profit organizations
Neumann and Mulder (2015)	0.60	37	TF	-	-	-	RE	-	6	Diverse profit and non-profit organizations
Ortega et al. (2013)	0.56	107	TF	-	-	-	TL	3	-	Hospitals
Raes et al. (2012)	0.49	28	TF	-	-	-	TL	3	-	University hospital
Raes et al. (2012)	0.17	28	-	-	LF	-	TL	3	-	University hospital
Sanders (2006)	-0.21	49	-	-	-	TF, TA, IN	TL	-	4	Defense organization
Savelsbergh et al. (2015)	0.34	30	CO, EM, TF	-	-	-	TL	1	4	Building, engineering, area development
Savelsbergh et al. (2015)	0.59	30	-	IS	-	-	TL	1	4	Building, engineering, area development
Schaubroeck et al. (2016)	0.54	82	EM	-	-	-	TL	1	-	Diverse service organizations
Schippers et al. (2008)	0.32	32	TF	-	-	-	RE	1	-	Diverse companies
Somech (2006)	0.50	136	EM	-	-	-	RE	3	-	Primary healthcare
Somech (2006)	0.52	136	-	IS	-	-	RE	3	-	Primary healthcare
Srivastava et al. (2006)	0.39	102	EM	-	-	-	SH	2	-	Hotel properties
Tung and Chang (2011)	0.44	79	EM	-	-	-	SH	2	-	Fast-food service industry
Van der Haar et al. (2017)**	0.17	14	-	IS	-	-	CC	3	-	Emergency command-and-control teams
Wang et al. (2017)	-0.03	66	-	-	-	DEN	TL	2	-	Business school students
Wong and Tjosvold (2010)	0.09	101	CO	-	-	-	SH, RE	-	4	Diverse firms
Wong and Tjosvold (2010)	0.16	101	EM	-	-	-	SH, RE	-	4	Diverse firms
Wong and Tjosvold (2010)	0.19	101	-	IS	-	-	SH, RE	-	4	Diverse firms

Qualitative studies (*N*=7)			TLSB				Task/team type		
Study (year)	*N*	Summary of effect Team leadership behavior on Team learning behavior	Person	Task	LF	TLB	A	D	Context
Brooks (1994)	4	Positive and negative by controlling power differences	EM	-	-	TL		4	High-tech manufacturing company
Bucic et al. (2010)	3	Positive on learning for routine or innovation	TF	TA	-	TL	1		Discipline-based university teacher teams
Chatalalsingh (2014)	2	Positive in facilitating a learning climate	CO, EM	IS	-	TL	3	-	Teaching hospital
Edmondson et al. (2001)	16	Positive by using their power for encouraging speaking up and framing for learning	EM	IS	-	TL	-	5	Hospitals implementing Minimally Invasive Cardiac Surgery
McKeown (2012)	1	Negative, caused by a lack of team's participation, trust and power	-	TA, IS	-	TL	1, 2	-	Enterprises in manufacturing
Nouwen et al. (2012)	2	Positive and negative in building social and structural learning conditions	CO, EM	IS	-	TL	3	3	Child welfare
Sauquet (2000)	3	Positive and negative in framing for learning	CO	IS	-	TL	-	4	NGOs, banking and pharmaceutical firms

Note: *r* = estimated average effect size; *N* = total number of teams; *TLSB* = Team leadership behavior, *Person* = Person-focused, *CO* = Consideration, *EM* = Empowering, *TF* = Transformational; *Task* = Task-focused, *BS* = Boundary spanning, *CC* = Constructive conflict, IS = Initiating structure, *TA* = Transactional; *Shared* = Shared leadership, *DEN* = Density, *IN* = Influence; *LF* = Laissez-faire; *TLB* = Team learning behavior, BC = Boundary crossing, CC = Constructive conflict, SH = Sharing, RE = Reflexivity, TL = a combination of three or more team learning behaviors; *Task and team type*: A = Adaptive, D = Developmental, 1 = Work teams, 2 = Management teams, 3 = Medical teams, 4 = Research and product/project development teams, 5 = Medical teams with a new task, 6 = Work teams with a new task; *Context* = context in which the study was conducted; *These studies reported two effect sizes of the influence of one leadership style on two separate team learning behaviors; **Van der Haar et al (2017) reported 40 effect sizes over two time-points ($N_{time\text{-}point\ 1}$ = 17, $N_{time\text{-}point\ 2}$ = 11), the effect sizes were transformed into one effect size and the number of teams were averaged into 14. ***Ashauer and Macan (2013) reported no correlation coefficient, so we converted the means and standard deviations into an *r* per leadership style. ****Lee et al. (2014) reported 5 separate effect sizes for empowering leadership that were all converted into one *r*. *****Hirst et al. (2004) was coded as 'consideration', because that was a better fit to their applied measurement than the term 'facilitative leadership' they used in their introduction.

METHOD FOR QUANTITATIVE STUDIES REPORTING MULTIPLE EFFECT SIZES

We used the shifting units method of Cooper (1989) to deal with studies that reported more than one effect size (e.g., Burke et al., 2006). On the one hand, aggregating multiple effect sizes per study into one effect size yields independence from studies and effect sizes. On the other hand, this aggregation diminishes specific valuable information that each effect size may hold, while the assumed correlation between different effect sizes for aggregation might be invalid (Hunter & Schmidt, 2004). Shifting units mean that the unit of analysis (e.g., study, subgroup, or moderator) and the number of effect sizes (*k*) may change depending on the hypothesis that is tested (Cooper, 1989). Cooper (1989) argued that this method serves as a compromise strategy to minimize violating the independence from effect sizes and to maximize using specific information within studies.

Of the 36 quantitative studies, 13 studies reported multiple effect sizes, as presented in Table 3.1. Of those 13 studies, the effect sizes of five studies could be aggregated into one per study and remained independent throughout the meta-analysis. Two of those five studies reported more than one effect size for the same leadership and team learning behavior. For these studies, one effect size was calculated by synthesizing the multiple correlation coefficients into one per study through running CMAs per study. The other three studies each reported two effect sizes for the influence of a single leadership style on two separate team learning behaviors. For these three studies, one effect size per study was calculated via separate CMAs. The multiple effect sizes in the remaining eight studies held specific valuable information for this meta-analysis, to which we applied the shifting units method as follows. For level 1 (the overall influence of team leadership on team learning, H1), the multiple effect sizes per study were synthesized into one effect size per study to yield maximum independence ($k_{level\ 1}$ = 36). For level 2 and 3 (H2-H7), the effect sizes of the eight studies were kept separate, because they contained the information for which we were searching (Hunter & Schmidt, 2004). This information included separate effect sizes for transformational and transactional leadership, or one effect size for consideration and another for empowering. As a consequence, the values for *k* in Table 3.2 and 3.3 vary.

QUALITATIVE META-ANALYTIC TECHNIQUES

For each qualitative study, meaningful findings on how team leadership was related to team learning served as the "unit of analysis" (Miles & Huberman, 1994). These meaningful findings were mostly detected in result sections, when a clear relation between leadership behavior and team learning was described. These findings were one or more sentences on: what team leadership behavior stimulated or inhibited team learning, or they contained descriptions of team leaders' behavior as an explanation of the success or failure of team learning in teams. Per study, all

collected meaningful findings were tracked, analyzed and summarized in terms of a positive and/or negative relationship. On the basis of the coded team leadership behaviors per study, similarity across the studies was sought. This resulted in a synthesis of the findings in three categories: (1) results for person-focused team leadership, (2) for task-focused leadership, and (3) a combination of both.

Table 3.2 Main effect of team leadership behavior and subgroup analyses of the effect of leadership sources and styles on team learning behavior

	k	*r*	*N*	Fisher *z*	*SE*	95% CI	*Z*	*p*	I^2	Fail-safe *N*
(hypothesis 1)										
Team leadership	36	.424	2448	.452	.046	(.362, .543)	9.779	.000	78.82	4128
(hypothesis 2)										
Leadership sources	36	.424	2448	.452	.046	(.361, .543)	9.743	.000	78.82	4128
Vertical leadership	29	.438	1999	.470	.052	(.368, .571)	9.074	.000	73.62	2930
Shared leadership	7	.364	449	.381	.105	(.175, .587)	3.627	.000	89.02	96
Vertical leadership	35	.414	2113	.440	.072	(.298, .582)	6.081	.000	74.94	4032
Person-focused	27	.458	1621	.494	.049	(.398, .591)	10.038	.000	71.10	2829
Task-focused	8	.330	492	.343	.095	(.158, .528)	3.629	.000	82.94	99
(hypothesis 3)										
Vertical person-focused	27	.434	1953	.464	.070	(.326, .603)	6.588	.000	74.54	2798
Consideration	4	.282	294	.290	.114	(.066, .514)	2.540	.011	87.04	19
Empowering	10	.462	1015	.500	.070	(.364, .636)	7.187	.000	79.15	595
Transformational	13	.490	644	.536	.069	(.400, .671)	7.763	.000	33.66	553
(hypothesis 4)										
Vertical task-focused	8	.234	492	.238	.206	(-.116, .642)	1.156	.248	82.94	99
Boundary spanning	1	.115	80	.116	.265	(-.405, .636)	.435	.663	0	n.a. (k<3)
Initiating structure	5	.476	349	.518	.128	(.267, .768)	4.051	.000	79.89	94
Transactional	2	-.022	63	-.022	.218	(-.448, .405)	-.099	.921	0	n.a. (k<3)

Note: *k* = number of effect sizes analyzed; *r* = estimated average effect size; *N* = total number of teams; *Fisher z* = transformed value of the raw correlations used in the analyses; *SE* = standard error; *95% CI* = 95% confidence interval; *Z* = score for significance tests; *p* = probability value of null; I^2 = percentage of total variance due to heterogeneity; *Fail-safe N* = number of missing studies bringing p-value > alpha.

Table 3.3 Moderator analyses of the influence of team task type on the effect of team leadership behavior on team learning behavior

	k	*r*	*N*	Fisher *z*	*SE*	95% CI	*Z*	*p*	I^2	Fail-safe *N*
Overall task type	30	.385	2028	.406	.050	(.308, .504)	8.109	.000	77.71	2268
Adaptive tasks	16	.385	1039	.406	.069	(.270, .541)	5.868	.000	74.72	652
Developmental tasks (hypothesis 5a)	14	.386	989	.407	.073	(.264, .549)	5.597	.000	80.75	475
Vertical leadership	25	.408	1682	.433	.047	(.340, .526)	9.125	.000	71.20	1779
Adaptive tasks	14	.426	927	.455	.064	(.330, .581)	7.116	.000	68.93	620
Developmental tasks (hypothesis 5b)	11	.385	755	.406	.071	(.268, .545)	5.735	.000	71.43	288
Shared leadership	5	.272	346	.279	.201	(-.115, .673)	1.388	.165	90.09	25
Adaptive tasks	2	.099	112	.100	.318	(-.524, .723)	.313	.754	43.94	n.a. (k<3)
Developmental tasks (hypothesis 6)	3	.378	234	.397	.259	(-.110, .905)	1.534	.125	93.85	21
Vertical person-focused	23	.432	1565	.463	.048	(.369, .557)	9.670	.000	68.56	1736
Adaptive tasks	13	.441	913	.473	.063	(.349, .597)	7.496	.000	66.73	623
Developmental tasks (hypothesis 7)	10	.422	652	.450	.074	(.306, .594)	6.113	.000	70.38	270
Vertical task-focused	7	.282	462	.289	.023	(-.005, .584)	1.926	.054	84.41	66
Adaptive tasks	4	.406	258	.430	.023	(.131, .729)	2.820	.005	86.38	44
Developmental tasks	3	.128	204	.129	.029	(-.205, .464)	.757	.449	0	0

Note: *k* = number of effect sizes analyzed; *r* = estimated average effect size; *N* = total number of teams; *Fisher z* = transformed value of the raw correlations used in the analyses; *SE* = standard error; *95% CI* = 95% confidence interval; *Z* = score for significance tests; *p* = probability value of null; I^2 = percentage of total variance due to heterogeneity; *Fail-safe N* = number of missing studies bringing p-value > alpha.

RESULTS

First, the quantitative results will be presented following the three analyses for testing each of the hypotheses: (a) an overall analysis on the main effect of team leadership behavior on team learning behavior (H1), (b) subgroup analyses to gage the effect of specific team leadership sources (H2) and styles (H3, H4), and (c) moderator analyses on how task type moderates the effect of each team leadership behavior on team learning behavior (H5, H6, H7). Finally, the qualitative results will be presented in three categories: (a) person-focused team leadership behavior, (b) task-focused team leadership behavior, and (c) a combination of both.

QUANTITATIVE RESULTS

OVERALL EFFECT OF TEAM LEADERSHIP BEHAVIOR ON TEAM LEARNING BEHAVIOR

As predicted, the fixed-effect analysis diagnosed that the heterogeneity of the 36 studies was significant ($Q = 165.24$, $df = 35$, $p < .01$), with an I^2 of 78.82. This validated further analysis, and applying the random-effect model. Table 3.2 shows the results for the main random effect size analysis.

As Table 3.2 shows, the coded studies report 36 independent effect sizes between team leadership and team learning behavior, based on a total sample of 2,448 teams. Overall, team leadership behavior explains 18% of variance in team learning behavior ($r = .424$, $p < .01$). This overall analysis shows team leadership is strongly and positively related to team learning behavior and provides support for hypothesis 1.

SUBGROUP EFFECTS OF DIFFERENT TEAM LEADERSHIP BEHAVIORS

The fixed-effect model showed adequate heterogeneity for further analysis via subgroup analyses using the random-effect model for (a) testing vertical versus shared leadership ($Q = 165.24$, $df = 35$, $p < .01$, $I^2 = 78.82$), and for (b) testing person-focused and task-focused leadership ($Q = 135.65$, $df = 34$, $p < .01$, $I^2 = 74.94$).

Table 3.2 presents the results of the subgroup analyses. First, subgroup analyses on 36 effect sizes in a total of 2,448 teams show that vertical ($r = .438$, $p < .01$) and shared leadership ($r = .364$, $p < .01$) both have a positive significant effect on team learning (explaining resp. 19% and 13% of the variance). This supports hypothesis 2. One study reporting an effect size of laissez-faire leadership was only included in testing hypothesis 2. Second, we further specified vertical team leadership into person-focused and task-focused team leadership behaviors. The studies on shared team leadership did not report enough effect sizes ($k < 3$) per specific style of shared leadership behavior for further specification. The subgroup analyses on specific team leadership behavioral styles, based on 35 effect sizes and 2,113 teams, show that vertical person-focused ($r = .458$, $p < .01$) and vertical task-focused team leadership behaviors ($r = .330$, $p < .01$) explain significant variance in team learning behavior (resp. 21% and 11%).

Third, we subgroup-analyzed specific vertical person-focused behaviors on 27 effect sizes and 1,953 teams, showing that consideration, empowering and transformational all three have a significant effect on team learning behavior (resp. $r = .282$, $r = .462$, $r = .490$, $p < .05$), with a very robust Fail-safe N for empowering and transformational team leadership behavior. This result supports hypothesis 3. Fourth, subgroup analyses on vertical task-focused behaviors, based on 8 effect sizes and 492 teams, reveal that only initiating structure is significant and strongly related to team learning ($r = .476$, $p < .01$), which partially supports hypothesis 4.

MODERATOR EFFECTS OF TASK TYPES

Table 3.3 presents the results of the moderator analyses based on a total of 30 effect sizes and a sample of 2,028 teams. Heterogeneity was adequate (Q = 130.12, df = 29, p < .01, I^2 = 77.71) for further analysis using random effects to calculate the effect within subgroups. Fixed effects were used to calculate the magnitudes of the differences across team types.

The moderator analyses are conducted at five levels: (1) overall, (2) vertical, (3) shared, (4) person-focused, and (5) task-focused. First, the overall moderator analysis is conducted on the independent effect sizes (k = 30). This overall level shows that the task type does not influence the effect of team leadership behavior (explaining 15% of team learning variance, r = .385, p < .01), with no differences between the subgroups in the fixed effects ($Q_{between}$ = 3.24, df = 1, p >.05). Second, moderator analysis at the level of vertical team leadership behavior shows that the effect of vertical team leadership behavior is significant for adaptive team types (r = .426, p < .01) and for developmental team types (r = .385, p < .01). The magnitude of the differences between the influence of these team types was significant ($Q_{between}$ = 6.49, df = 1, p <.05). This finding supports hypothesis 5a. Third, moderator analysis at the level of shared team leadership behavior shows that the magnitude of the differences between the team types was significant ($Q_{between}$ = 6.05, df = 1, p <.05), but the effect of shared team leadership behavior on each team type is not significant. This finding rejects hypothesis 5b. The studies on shared team leadership did not report enough effect sizes (k < 3) per specific style of shared leadership behavior for further specification.

Fourth, moderator analysis at the level of vertical person-focused leadership shows that the task type does not moderate the effect of person-focused leadership on team learning (r = .432, p < .01, explaining 19% of team learning variance). This result means that vertical person-focused leadership is beneficial for teams with adaptive tasks (r = .441, p < .01) and for teams with developmental tasks (r = .422, p < .01). The magnitude of the differences between adaptive and developmental tasks for vertical person-focused leadership was not significant ($Q_{between}$ = 3.52, df = 1, p >.05). This finding rejects hypothesis 6. Fifth, moderator analysis on the level of vertical task-focused leadership shows that the task type moderates the effect of task-focused leadership on team learning. Vertical task-focused leadership is only supportive of team learning in teams that deal with adaptive task types (r = .406, p < .01, explaining 16% of team learning variance). For teams with developmental tasks, there is no effect of vertical task-focused leadership on team learning. The magnitude of the differences between adaptive and developmental tasks for task-focused leadership was significant ($Q_{between}$ = 16.01, df = 1, p <.00). For these reasons, hypothesis 7 is supported.

QUALITATIVE RESULTS

Our sample contains 7 qualitative studies based on a total of 31 teams, as displayed in Table 3.1. Most studies examined both task-focused and person-focused leadership. Our sample did not contain a qualitative study on shared leadership. Overall, in line with the quantitative results, the qualitative studies confirm both vertical person-focused and task-focused leadership behaviors foster team learning behavior. However, the findings from qualitative studies deepen this result by suggesting that the positive influence of task-focused leaders on learning in teams with adaptive tasks has a limit. Based on the findings tracked in the qualitative analyses, three key categories provide deeper understanding on when there is a relationship between team leadership behavior and team learning behavior.

The first category indicates that person-focused leadership fosters learning by encouraging, modeling, empowering and controlling power differences in teams with adaptive and developmental tasks. Bucic, Robinson, and Ramburuth (2010) showed that for adaptive tasks, transformational leadership behaviors encouraged contributions and inspired team members to push their boundaries. In turn, teams were able to create new ideas collectively. Furthermore, Nouwen, Decuyper, and Put (2012) pointed out that combining consideration and empowering leadership behaviors fostered team learning for adaptive tasks, because these leaders maintained close social relationships, and build respect, trust and group cohesion. They encouraged speaking up by modeling and asking feedback themselves and showing how to ask feedback. Their actions encouraged the teams' self-managing competencies and leadership skills. For developmental tasks, however, Brooks (1994) showed that empowering teams only benefits team learning if the team leaders were able to use their power to control or regulate the power differences in their teams. Hence, all team members were equal and had the collective power to manage the team and engage in learning behaviors. If the power differences were not controlled, the most powerful person or the team member with the highest status dominated the team, which hindered team members' reflection and actions.

The second category implies that task-focused leadership for learning in teams with adaptive tasks has a limit. Bucic et al., (2010) showed that for teams with adaptive tasks, transactional leadership supported team learning behaviors, because it provided structures and procedures, and subsequently reinforced building routines. However, both McKeown (2012) and Nouwen et al. (2012) revealed that for teams with adaptive tasks, team leaders could also over-structure work processes, which inhibited team learning. Moreover, they showed that if team leaders did not involve team members in decision-making, or shared the power on team goals and actions, team trust (in each other and the leader) decreased and the motivation for team learning vanished.

The third, and final, category suggests that combining person-focused and task-focused leadership behaviors benefits learning in teams with adaptive and

developmental tasks. Bucic et al. (2010), Chatalalsingh and Reeves (2014), and Edmondson, Bohmer, and Pisano (2001) studied leaders who combined person-focused and task-focused leadership behaviors. For teams with adaptive tasks, Bucic et al. (2010) found setting structures and procedures (i.e., transactional leadership) and encouraging contributions (i.e., transformational leadership) at the same time fostered learning for routine building and creating innovation, since this combination provided the team a clear direction and supported team members in sharing and co-constructing their ideas into new knowledge. Additionally, Chatalalsingh and Reeves (2014) showed that shifting between supporting (i.e., consideration by emphasizing the relation with others), directing (i.e., initiating structure with a focus on task accomplishment), coaching (i.e., empowering for building relations and task achievement) and delegating (i.e., empowering by allowing teams to take responsibility) behaviors fostered interaction and learning in teams with adaptive tasks. In this manner, the team leader adapted his actions to the specific situation and current needs of the team. Next, Edmondson et al. (2001) found that leaders of teams with developmental tasks facilitated learning processes by: motivating through communicating members' unique skills; inspiring through framing the task as a challenge; and coordinating the team activities for structuring the processes. Sauquet (2000) also revealed that encouraging open discussions, handling differences, framing meetings and defining the team's purpose fostered learning in teams with developmental tasks. Moreover, he showed that if these considerative and initiated structure behaviors were absent, it negatively influenced team learning. Sauquet (2000) observed that if team leaders did not provided a shared team goal, it made team members less interdependent, and therefore they did not feel the need to share knowledge and to seek disagreement for the sake of building new knowledge together.

CONCLUSION AND DISCUSSION

We meta-analyzed how and under which conditions when team leadership behavior powers team learning behavior. Three key findings appeared. First, the main analysis shows that team leadership behavior had a substantial positive influence on team learning behavior: it explained 18% of the variance in team learning (H1). This overall effect of leadership confirms earlier claims that leadership is a crucial factor for facilitating team learning (e.g., Zaccaro et al., 2008).

Second, the effect of different team leadership behavioral sources (i.e. vertical and shared) and styles (i.e., person-focused and task-focused) on team learning behavior was analyzed. Subgroup analyses showed that both vertical and shared leadership have a significant effect on team learning behavior, accounting for respectively 19% and 13% of team learning variance (H2). This is an important finding because it relates vertical and shared leadership to team learning, which

contributes to Nicolaides et al.'s (2014) meta-analysis that focused solely on the relationship of vertical and shared team leader behavior and team performance. Moreover, the subsequent subgroup analyses further specified that vertical person-focused leadership behavior accounted for 21%, and vertical task-focused leadership behavior for 11% of the team learning behavior variance. These detailed findings shift the traditional emphasis from person-focused leadership behavior towards task-focused leadership behavior as well (e.g., Edmondson, 1999; Gibson & Vermeulen, 2003; Hirst et al., 2004; Lorinkova, Pearsall, & Sims, 2012). In addition, our findings build upon the preliminary meta-analysis by Burke et al. (2006) on the effect of team leadership behavior on team learning behavior. Their analysis showed that team leadership explained 31% of team learning behavior variance; however, their sample contained only three studies. Moreover, these studies only involved vertical, person-focused (i.e. empowering) leadership behaviors. Our meta-analysis shows that a growing amount of research on team leadership behaviors has become available that includes more detailed information about leadership behavior: shared, vertical, person-focused and task-focused team leadership behaviors. Our analysis shows that most of these studies strongly support the notion that team learning behavior depends on team leadership behavior.

Third, this study further explored the role of leadership, and examined how task type (i.e., adaptive and developmental) moderates the effect of (sources and styles of) team leadership behavior on team learning. Our analyses showed that across task types, vertical person-focused team leadership behavior supports team learning (H6). This is in contrast to London (2014), who suggested that mainly developmental tasks benefit from person-focused leadership. The moderating effect of task type was only discovered for vertical task-focused team leadership (H7). Vertical task-focused leadership was highly beneficial for learning in teams dealing with adaptive tasks (explaining 16% of team learning variance), but was not significant for teams facing a developmental tasks. This confirms the reasoning of London (2014), who suggested that task-focused leadership supports learning for adaptive tasks (e.g., Vera & Crossan, 2004). The findings from qualitative studies deepen this result by providing more understanding of the effect of task-focused leaders. These studies suggest that the positive influence of task-focused leaders on learning in teams with adaptive tasks has its limits. The qualitative syntheses identify that task-focused leaders inhibit team learning if they put too much emphasis on the task and over-structure the process (e.g. McKeown, 2012). Furthermore, the qualitative findings indicate that combining person-focused and task-focused team leadership behaviors can stimulate team learning for adaptive and developmental tasks. It is suggested that through combining both leadership styles, team leaders are able to structure and encourage team learning behaviors at the same time. Shifting between both leadership styles depending on the specific team's situation and needs is in line with earlier suggestions, referred to

for example as situational leadership (Hersey & Blanchard, 1993), ambidextrous leadership (Tushman & O'Reilly, 1996), or more recently as a paradox-savvy leadership (Waldman & Bowen, 2016). Our findings provide new knowledge that confirms and specifies earlier suggestions that the team's task plays a role in considering which leadership behavior is most effective for team learning (Edmondson et al., 2007; London, 2014).

In sum, we conclude that team leadership behavior is necessary to support team learning and our findings contribute towards understanding when. Team leadership powers team learning through person-focused and task-focused behaviors exhibited by a single leader and by team members. This involves leadership behaviors such as building trust and relations, empowering and challenging team members and structuring teams' tasks and goals. It is suggested that this process should not be over-structured; team members should feel they are in control of, for example, the project design and decision-making. In addition, team leaders can vary their behavior depending on the team task: if team leaders aim to foster development in their teams, our findings suggest they should mainly invest in the team members, and not restrain teams from learning by emphasizing their tasks.

LIMITATIONS

Conducting a meta-analysis means dealing with many decisions that enable a generalization of the studies for the purpose of synthesis (Cooper, Hedges, & Valentine, 2009). Our efforts resulted in a sample that provided a sufficient amount of comparison and variety for meta-analyses, as shown by the coding phase and the *Q*-tests. The team and task types varied (Table 3.1), so our results seem transferable to different contexts. Our sample of 43 quantitative studies with 92 effect sizes was sufficient for the analyses conducted. However, the effect sizes for specific shared team leadership behavior were too limited to divide into subgroups, and were very small in the moderator analyses. Furthermore, the measurements used in the underlying studies varied (i.e., measuring specific behaviors, the extent to which team members rely on other team members for leadership, and the question whether other team members play a role in decision-making). Nicolaides et al. (2014) also discovered variation in measuring shared leadership and found some evidence that this fact influenced the calculating effect. The small effect sizes for specific shared team leadership styles and the variation in measurement point to the need for more research on how specific behavioral styles and shared team leadership behavior can support team learning behavior. To conclude, we searched for six different team learning behaviors, but we did not have enough studies to meta-analyse them separately. Half of the studies examined a combination of three or more team learning behaviors and one third of the identified studies examined only sharing. Alhough our data did not suggest any differences

between team learning behaviors, it might be interesting for future research to further understand how team leadership behavior relates to specific team learning behaviors.

FUTURE RESEARCH

Our analysis of the literature reviewed shows that research on team leadership – as related to team learning behavior – is relatively young, yet it offers concrete recommendations for future research. Shared and vertical as well as person-focused and task-focused team leadership behaviors are all important to facilitate team learning behavior. We recommend including different styles and sources of leadership behavior in research which examines their effects on team learning behavior (e.g. Døving & Martín-Rubio, 2013; Hoegl & Parboteeah, 2006; Lorinkova et al., 2012; Wong & Tjosvold, 2010). In doing so, we suggest three directions for future research. First, knowledge on how different team leadership behaviors interact over time is needed. For example, what can a vertical team leader do to support teams in realizing various kinds of shared leadership behavior? In addition, does the influence of various kinds of team leadership behavior on team learning develop over time? Lorinkova et al. (2012) is a preliminary example of a study including two leadership styles: empowering and directive. They show that teams initially benefit the most from directive leaders, but over time are outperformed by teams led by empowering leaders. This finding suggests that the phase (e.g., start or end) of a team process plays a role in examining which team leadership behavior is the most important for team learning, and when. To this end, longitudinal studies are recommended, which may provide empirical insight into how leadership behavior may shift in style and source over time.

Second, in such longitudinal approaches, it is recommended to also include the reciprocal effect of the team process on leadership behavior. To date, most studies focus on leadership as an input variable for team learning processes, but it is argued that leadership also adapts to the team's situation at hand (Day et al., 2004; Zaccaro et al., 2008). Edmondson et al. (2001) reasoned that team leaders might adapt their behaviors depending on the actual team processes, such as stimulating team members toward a more routine or innovative work approach by stimulating not only to share but also to seek controversy. We suggest that an understanding of these processes requires examining the reciprocal effect of the team process and leadership behavior, as well as how this relationship develops over time (e.g., Burke et al., 2006; Day et al., 2004; Ilgen, Hollenbeck, Johnson, & Jundt, 2005; Wang, Han, Fisher, & Pan, 2017).

Third, our quantitative findings show that task-focused leadership supports learning in teams with an adaptive task. The qualitative results imply the same, but they also suggest that leaders who over-structure the process affect team learning negatively. This fact suggests that there might be some sort of optimum value for

the influence of task-focused team leadership on team learning, though perhaps the relationship is non-linear. It is recommended to examine this suggestion in order to find out how leaders of teams with an adaptive task can provide just enough direction so as to support team learning without over-structuring the process.

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*References marked with an asterisk indicate studies included in the meta-analysis.

4 VERTICAL OR SHARED? WHEN LEADERSHIP SUPPORTS UNIVERSITY TEACHER TEAM LEARNING FOR EDUCATIONAL CHANGE

ABSTRACT

University teacher teams can work towards educational change if they develop new knowledge through the process of team learning behavior, such as discussing practices. However, it has been demonstrated that teachers do not routinely challenge ideas and create new knowledge in a team. Team leadership behavior is essential to provide support but it is unclear how. We studied 52 university teacher teams (281 respondents) responsible for educational change. Multiple regression analysis showed that team learning behavior was best supported by a shared transformational leadership style that challenged the status quo and stimulated each other's intellect. Moderator analyses revealed that perceived task complexity influenced the relationship between vertical empowering team leadership behavior and team learning behavior, such that this leadership style was only having an effect where task complexity was low. This study is unique in relating multiple team leadership types to team learning behavior and examining this in higher education.

THIS CHAPTER IS BASED ON:

Koeslag-Kreunen, M., Van den Bossche, P., Van der Klink, M. R., , & Gijselaers, W. H. (under review). Vertical or shared? When leadership supports university teacher team learning for educational change.

Higher education institutions encounter a continuous need to change their programs to keep up with society's demands (Barber, Donnelly, & Rizvi, 2013). Kezar (2011) has argued that bringing about such necessary educational change has become increasingly complex, which urges to combine the individual expertise of university teachers[5]. Nowadays it is necessary to take into account issues such as developing courses for unknown jobs (Lehtinen, Hakkarainen, & Palonen, 2014), or using multidisciplinary expertise to design interprofessional programs (Stalmeijer, Gijselaers Wolfhagen, Harendza, & Scherpbier, 2007). Research shows that combining expertise in teams enables professionals to deal with such complex tasks (Kozlowski & Ilgen, 2006). Teams can be defined as "a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems" (Cohen & Bailey, 1997, p. 241). To be specific, this does not only mean working at the same department, but actually sharing responsibility for developing educational change (Koeslag-Kreunen, Van der Klink, Van den Bossche, & Gijselaers, 2018).

One of the key processes that enable teams to deal with complex tasks is team learning behavior. Typically, this occurs when team members share their individual knowledge and ideas with each other, and discuss and integrate what is shared at the team-level (Kozlowski & Ilgen, 2006). This process yields new shared cognitions that facilitate teams in modifying ideas and building new solutions (Van den Bossche, Gijselaers, Segers, and Kirschner, 2006). Accordingly, there is abundant evidence that team learning behavior is an important predictor for team performance (Kozlowski & Ilgen, 2006; Van den Bossche et al., 2006). However, more is required than simply connecting university teachers in teams. Purposefully identifying different view points determine whether teacher teams move beyond daily routines, allowing them to develop new solutions (Koeslag-Kreunen, Van der Klink et al., 2018). Yet, it appears that university teachers do not routinely share and discuss and challenge their ideas and knowledge with colleagues (Furco & Moely, 2012). They are not used to discussing their practices together (Cox, 2004) and regularly perceive diversity as an obstacle to share personal ideas (Roxå & Mårtensson, 2009). Therefore, their team learning behavior needs support to overcome these barriers (Furco & Moely, 2012).

Leadership has often been recognized as an important factor to facilitate such processes in higher education (Bryman, 2007). This can involve person-focused styles to support creativity and collaboration, and task-focused styles that structure processes (Bryman, 2007). For example, Bucic, Robinson, and Ramburuth (2010) uncovered that team leaders can encourage university teacher team

[5] University teachers are here defined as professional educators who work at higher education institutions and educate undergraduates, graduates or post-graduates for a specific profession (Houle, Cyphert, & Boggs, 1987). Their main focus is on teaching for professional practice and on advancing knowledge and practice of professions through practice-based research and development (Houle et al., 1987).

learning by both structuring the task and challenging to share ideas. Furthermore, it is argued that such behaviors are not only vertical, top-down influences from single leaders to teachers but also shared influence processes between leaders and teachers (Lumby, 2018).

However, team research across disciplines showed that not just any kind of team leadership behavior supports team learning behavior. The meta-analysis of Koeslag-Kreunen, Van den Bossche, Hoven, Van der Kink, and Gijselaers (2018) revealed that the team task has a large influence on determining which specific style (i.e., person- or task-focused) or source (i.e., vertical or shared) of team leadership behavior is most supportive for team learning behavior. They showed that person-focused leadership supported learning behavior in teams with low and high-complexity tasks for development. On the other hand, task-focused leadership only supported learning behavior in teams with low-complexity tasks for adaptation. The influence of how a task is perceived by university teacher teams might also determine how their team learning behavior is best supported. University teacher teams that are established to work towards educational change may not naturally observe that they need to develop new knowledge together, because they tend to neglect new ideas (Furco & Moely, 2012) and avoid controversy that may cause conflict (Roxå & Mårtensson, 2009).

To date, however, it is unknown what kind of team leadership behavior supports team learning behavior in university teacher teams, and how task complexity influences those relationships. First, only a few studies have investigated (university) teacher team learning behavior (Koeslag-Kreunen, Van der Klink et al., 2018). Second, if such studies exist, they mostly study other collaborative forms, such as learning communities (e.g., Furco & Moely, 2012). Third, leadership research in higher education is predominantly focused on vertical leadership (Lumby, 2018) and largely lack outcomes of shared leadership (Floyd & Fung, 2017). Fourth, team leadership research hardly relates multiple leadership types to team learning behavior (Burke et al., 2006; Nicolaides et al., 2014). Fifth, these gaps result in limited empirical findings on the moderating role of task complexity (Koeslag-Kreunen, Van den Bossche et al., 2018). As a consequence, this study includes multiple types of team leadership behavior and examines which types support team learning behavior in university teacher teams (RQ1) and how task complexity influences those relationships (RQ2). In doing so, we build upon team and educational research. This study is based on the conceptual model, with two research questions presented in Figure 4.1 that will be discussed next.

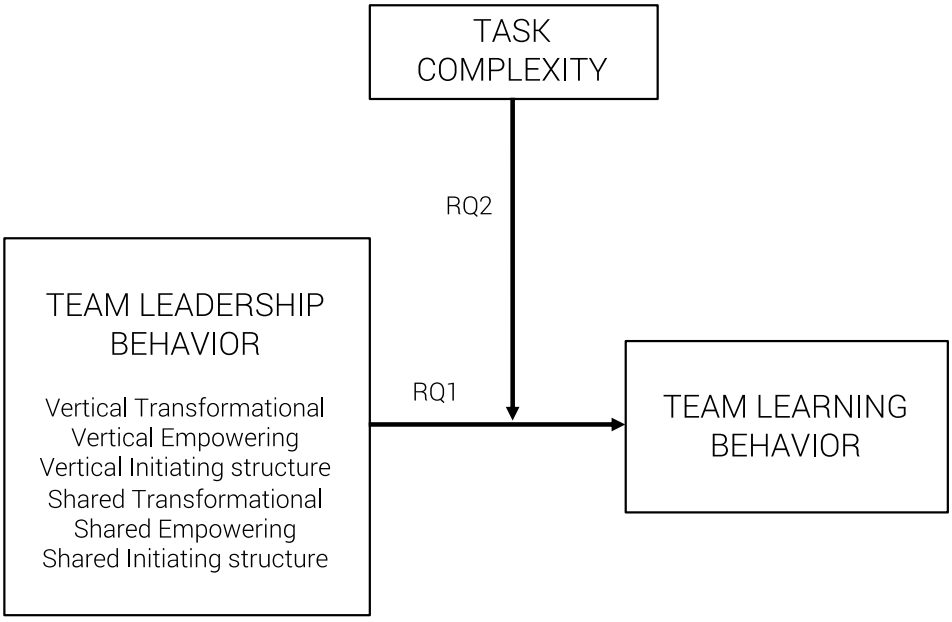

Figure 4.1 Conceptual model with two research questions

DEVELOPING EDUCATIONAL CHANGE THROUGH TEAM LEARNING BEHAVIOR

Team learning behavior can be defined as the collective discourse activities of team members that enable a collective questioning of traditions, seeking controversy and using multiple inputs (Edmondson, 1999). These activities can yield new ideas and solutions, because they develop shared knowledge that was not previously present in the team (Van den Bossche et al., 2006). Stalmeijer et al. (2007) showed that university teacher teams are able to develop and implement new educational programs through engaging in team learning behavior. They included three team learning behaviors (i.e., sharing, co-construction and constructive conflict) that enable teams to shape individual interpretations of ideas and knowledge into a deeper understanding (Van den Bossche et al., 2006). *Sharing* means exchanging each other's ideas, knowledge and experiences (Faraj & Sproull, 2000). Building on what is shared, by refining statements, modifying previous ideas, and adapting ideas is defined as *co-construction* (Baker, 1994). *Constructive conflicts* involves openly acting upon diversity and discussions that may occur by asking critical questions and integrating opposing ideas into an (dis)agreement (Van den Bossche et al., 2006). Stalmeijer et al. (2007) showed that a combination of these team learning behaviors predict the team performance of multi-disciplinary

university teacher teams, because they enable the integration of diversities into newly developed courses of high quality.

TEAM LEADERSHIP BEHAVIOR FOR OVERCOMING BARRIERS TO ENGAGING IN TEAM LEARNING BEHAVIOR

It is argued that university teachers need the support of team leadership behavior to engage in team learning behavior, because they need to overcome their natural habits of working independently and avoiding change (Cox, 2004; Furco & Moely, 2012). Research on how team leadership behavior influences team learning behavior has revealed that many different sources and styles can be supportive (Koeslag-Kreunen, Van den Bossche et al., 2018) Team leadership behavior from the *vertical source* is performed by the team leader who is formally appointed to lead the team (Pearce & Sims, 2002). This is defined as "the process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives" (Yukl, 2010, p. 8). Team leadership behavior that stems from team members themselves is defined as the *shared source* (Pearce & Sims, 2002). As such, shared team leadership is "a dynamic, interactive influence process among individuals for which the objective is to lead one another to the achievement of group or organizational goals or both" (Pearce & Conger, 2003, p. 1). Koeslag-Kreunen, Van der Klink et al. (2018) found that both sources coexist and can support team learning behavior within university teacher teams. Additionally, Högfeldt et al. (2018) showed that both sources support the development of educational programs by university teachers, because the vertical source provides structure, which reinforces collaboration, and the shared source emphasizes the input of all team members. These findings indicate that both sources of team leadership behavior can promote university teacher team learning behavior.

Pearce and Sims (2002) showed that the vertical and shared source can display multiple specific styles of team leadership behavior. The present study focuses on three styles of team leadership behavior that have been found to support team learning behavior across disciplines (Koeslag-Kreunen, Van den Bossche et al., 2018): transformational, empowering and initiating structure. *Transformational team leadership behavior* means motivating team members in moving beyond their own interests and stimulating their creativity in changing routines and attempting to solve problems (Bass & Avolio, 1994). Particularly, challenging the status quo and providing intellectual stimulation is important for triggering the learning behavior of university teacher teams that need to develop new knowledge together. Bucic et al. (2010) showed that these specific transformational behaviors support learning in university teacher teams, because they encourage members to take the risk of learning and seeking alternative approaches. Van Ameijde, Nelson,

Billsberry, and Van Meurs (2009) showed that sharing such team leadership behaviors can build trust and ownership, which can motivate university teachers to build new knowledge collaboratively. Accordingly, transformational team leadership behavior by challenging the status quo and providing intellectual stimulation, from vertical and shared sources, may support the learning of university teacher teams that need to work towards educational change.

Empowering team leadership behavior is defined as actively developing the self-management skills of the team (Burke et al., 2006). Empowerment can be displayed through various behaviors, such as participative goal setting and encouraging teamwork (Pearce & Sims, 2002). Encouraging teamwork can support teams in perceiving teamwork as an opportunity for learning instead of an unknown obstacle (Pearce and Sims, 2002). This might be especially important for university teacher team learning, because, for example, their independent work tradition (Cox, 2004). Koeslag-Kreunen, Van den Bossche et al. (2018) indicated that integrating individual issues at the team-level through vertical and shared sources of team leadership relates to university teacher team learning behavior. For these reasons, it is assumed that vertical and shared empowering team leadership behavior through encouraging teamwork supports university teacher team learning behavior. *Initiating structure* means providing structure by assigning team tasks, working methods and goals (Døving & Martín-Rubio, 2013). Initiating structure may support university teacher team learning behavior if it stems from both vertical and shared sources, because it can serve as a formal strategy to bring focus to the interaction (Somech, 2006). Organizing structure together can support the involvement of all team members (Högfeldt et al., 2018).

In sum, it is suggested that vertical and shared sources of leadership behavior can promote team learning behavior through transformational, empowering and initiating structure styles. However, it is not clear which specific type of team leadership behavior best supports team learning behavior in university teacher teams, because the different leadership sources and styles have mostly been studied separately or principally related to team performance (Burke et al., 2006; Nicolaides et al., 2014). As a consequence, we present the following first research question:

Research question 1. Which type of team leadership behavior (i.e., vertical transformational, vertical empowering, vertical initiating structure, shared transformational, shared empowering, and/or shared initiating structure) positively influences university teacher team learning behavior?

THE MODERATING ROLE OF TASK COMPLEXITY

It is suggested that the task perception of university teacher teams regarding the complexity influences which specific types of team leadership behavior support

their learning behavior. This study defines task complexity as the perceived level of difficulty and the absence of standard solutions (Cooke, Kiekel, & Helm, 2001). Observing a task as low-complex implies sensing that using and adapting existing knowledge and routines is enough for the level of difficulty (Ellström, 2001). Perceiving a task as high-complex indicates that team members sense that they cannot rely on their existing knowledge (Cooke et al., 2001). They recognize that they need to develop new knowledge together to deal with this difficulty and to create new solutions (Ellström, 2001). Koeslag-Kreunen, Van den Bossche et al. (2018) showed that task complexity moderates between vertical team leadership behavior and team learning behavior: team learning behavior for low and high-complex tasks is supported by transformational and empowering styles, because these styles focus on dealing with uncertainties and encourage interactions. Team learning behavior for low-complex tasks is supported by vertical initiating structure, because it focuses on reinforcing routines and using protocols (Koeslag-Kreunen, Van den Bossche et al., 2018). It is unclear how task complexity moderates the influence of shared team leadership behavior since research does not differentiate between specific shared team leadership behaviors or did not relate them to team learning behavior (Koeslag-Kreunen, Van den Bossche et al., 2018; Nicolaides et al., 2014). As a result, we define our second, and final, research question:

Research question 2. Does perceived task complexity moderate the influence of team leadership behavior (i.e., vertical transformational, vertical empowering, vertical initiating structure, shared transformational, shared empowering, and/or shared initiating structure) on team learning behavior?

METHOD

SETTING AND PROCEDURE

This study was conducted at a Dutch university that educates undergraduates and offers bachelor and master tracks for the professions. Leaders of organizational units representing various related disciplines were asked to identify teacher teams that share the responsibility for an innovative or new task that contributes to educational change. The team size had to range between three and 20, and the minimum team age had to be at least two months, ensuring sufficient occurrence of team interactions. The team's leadership could stem from a formal leader and/or being shared among team members. The 86 identified teams were invited by contacting the team leader and/or the team members and asking them to participate, accompanied by the study's purpose, confidentiality assurance, and the selection criteria. Of the 86 contacted teams, 25 teams dropped out (*no response/follow-up* = 8; *no time for participation* = 3; *did not meet criteria* = 8; *did not participate* = 6).

SAMPLE

61 Teacher teams (a 71% response rate) with a total of 319 team members participated. These teams represented different disciplinary domains: arts, business and economics, educational sciences, engineering, health, law, management, and social studies. Team tasks were varied, but all contained goals to work towards educational change, ranging from developing new curricula, conducting multidisciplinary research, starting up a new research department, developing a different educational management strategy, and implementing a new interprofessional course, to evaluating and redesigning existing forms of assessments. The data of this initial sample were used to assess scale reliability. Further analyses were performed at the team level, because this study focuses on team constructs. Therefore, teams having a representative response of at least two-thirds of their members were selected for further analyses (Van Mierlo, Vermunt, & Rutte, 2008). A total of 52 teams (281 participants) were selected, with a mean team age of 1.52 years (*SD* = 2.01, *range* = .25 to 12.5 years) and an average team size of 7.76 members (*SD* = 5.38, *range* = 2 to 20). On average, the participants (50% female) were 46.44 years old and worked 11.22 years at this university. Of these 52 teams, 43 teams had both vertical and shared leadership in their teams, and nine teams had no formal leader.

INSTRUMENTS

Team leaders and members completed an anonymous questionnaire individually, consisting of scales taken from validated questionnaires (presented in the appendix). The first question verified the team evaluated through the survey. The scale items started with the following instruction: "Please indicate to what extent you agree with the following statements regarding this team". The response scale ranged from 1 (strongly disagree) to 7 (strongly agree). Scale reliability was sufficiently high (Cronbach α values ranged from .82 to .94), as reported in Table 4.1.

Team learning behavior was measured with the nine-item scale used by Van den Bossche et al. (2006). Example item: 'Team members elaborate on each other's information and ideas'. A record error caused one dysfunctional item.

Team leadership behaviors were measured with three scales of Pearce and Sims (2002). These items examined leadership behavior twice: once for team members as a whole (shared leadership), and once for the team leader (vertical leadership). The scales measured *Transformational leadership* (eight items: three items on 'Challenge the status quo' , five items on 'Intellectual stimulation'), *Empowering* (three items on 'Encouraging teamwork'), and *Initiating structure* (six items: three items on 'Assigned goals', three items on 'Instruction and command'). Example items: 'My team leader (members) is (are) (a) non-traditional type(s) that "shake(s) up the system" when necessary' (transformational), 'My team leader (members) encourages (encourage) me to work together with other individuals who are part of

the team' (empowering), and 'When it comes to my work, my team leader (members) gives (give) me instructions on how to carry it out (initiating structure).

Task complexity was measured with a five-item scale used by Sarin and McDermott (2003). Example item: 'The development process associated with the product was relatively simple' (reverse scored). These items were accompanied with this short definition on complexity: 'Complexity is defined here as the level of difficulty and the absence of standard solutions'.

Table 4.1 Descriptives, correlations and internal consistencies among team-level variables

		M	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1.	Team size	5.40	3.64												
2.	Team age (years)	1.52	2.01	.70**											
3.	Team learning behavior	5.72	.67	-.39**	-.18	(.91)									
4.	Vertical transformational leadership	5.73	.67	-.04	.02	.49**	(.94)								
5.	Vertical empowering leadership	5.51	.73	-.13	-.07	.26	.67**	(.87)							
6.	Vertical initiating structure leadership	4.60	.91	.03	-.03	.25	.52**	.23	(.90)						
7.	Shared transformational leadership	5.48	.67	-.30*	-.12	.82**	.41**	.25	.14	(.92)					
8.	Shared empowering leadership	5.14	.66	-.23	-.15	.66**	.45**	.48**	.15	.78**	(.82)				
9.	Shared initiating structure leadership	4.52	.68	-.25	-.31*	.58**	.20	.07	.14	.64**	.76**	(.88)			
10.	Task complexity	5.62	.81	-.08	-.14	.22	.30*	.26	-.01	.26	.33*	.16	(.85)		
11.	Team performance	5.57	.73	-.26	-.05	.83**	.41**	.24	.22	.72**	.54**	.51**	.40**	(.92)	
12.	Team performance, external raters***	5.89	.84	.13	.01	.24	.25	.17	.06	.15	.19	.52**	-.15	.41*	(.89)

N = 52 teams (*N* = 43 teams for vertical team leadership). Scale reliabilities are in parentheses along the diagonal (*N* = 319).

p < .05* *p* < .01** (two tailed)

***Correlations of 38 external raters (*N* = 27 teams); the displayed correlation with Team performance is based on three items; scale reliability of this measurement is on 130 participants.

We assessed *Team performance* by combining the three-item team performance scale of Hackman (1987) and the three-item scale on team effectiveness of Hackman (1989). Example item: 'We have completed the task in a way we all agree upon'. External raters were used to validate these self-ratings (e.g., Edmondson, 1999). We asked participants to give us permission to obtain external judgments on team performance and to propose managers or supervisors (not team members) that were able to judge their team performance independently based on three items (i.e., 'This team meets or exceeds its customers' expectations'; 'This team does superb work'; 'I am satisfied with the performance of this team'). Members of 33 teams unanimously agreed to us obtaining external ratings. All suggested 57 external raters were

contacted by the first author. 38 External raters responded. This process yielded external ratings for 27 teams. The self-ratings and external ratings were consistent (r = .407, p < .05, N = 27) indicating valid self-ratings for team performance.

Team size and team age were included as *control variables*. Table 4.1 presents the descriptives, correlations and internal consistencies.

MULTIPLE SOURCE RATINGS AND DATA AGGREGATION

The team constructs were self-rated by team members and leaders who were considered to be able to reflect and bring to bear multiple perspectives on performed team behaviors (Atwater, Waldman, & Brett, 2002). Their individual scores are considered as repeated measures (Van Mierlo et al., 2008). These individual data points are interdependent and related to the team level of the judged construct, and are therefore only meaningful for interpretation when aggregated at the team level (Van Mierlo et al., 2008). We used three measures to assess data aggregation reliability per variable (Dixon & Cunningham, 2006). First, we assessed the level of agreement among the raters and corrected for the number of items per scale by computing the $r_{WG(J)}$ multiple item estimate of James, Demaree, and Wolf (1984). Per variable, we took the median based on the $r_{WG(J)}$s per team; $r_{WG(J)}$ >.71 is considered a strong and $r_{WG(J)}$ >.91 is considered a very strong agreement (LeBreton & Senter, 2008). Second, we calculated the intra-class correlations (*ICC1*) to assess if the data is nested in teams, meaning that ratings depend on the team rather than being independent of the team, with >.50 as the cut-off point (LeBreton & Senter, 2008). Following Cohen and Dovey (2005), we used the formula for unequal group sizes in an unbalanced design. Third, we assessed the extent to which the teams differ from each other by calculating interclass correlations (*ICC2*). We used Bliese's (2000) *ICC2* formula with >.50 as the cut-off point (LeBreton & Senter, 2008). Table 4.2 presents the three aggregation indices per team construct. Evaluating these indices, we concluded that aggregating the individual ratings at the team level is reliable.

Table 4.2 Aggregation indices per team construct

		$R_{WG(J)}$	*ICC1*	*ICC2*
Team learning behavior		.97	.81	.77
Vertical team leadership behavior	Transformational	.94	.66	.49
	Empowering	.84	.58	.26
	Initiating structure	.94	.57	.23
Shared team leadership behavior	Transformational	.95	.75	.66
	Empowering	.79	.67	.51
	Initiating structure	.86	.68	.53
Task complexity		.89	.77	.71
Team performance		.96	.80	.75

Note. $R_{WG(J)}$ = multiple item median with-in group agreement; *ICC1* = intra-class correlations for unequal group sizes examining total variance due to team variance; *ICC2* = intra-class correlations examining distance between variance and within variance.

ANALYSES

Data analyses consisted of several steps. Skewness and kurtosis values indicated a normal distribution of the data. Next, three correlations (see Table 4.1) were above r >.80 and were assessed for multicollinearity to ensure meaningful interpretation (Field, 2009). First, team learning behavior and team performance showed a strong correlation of r = .83, but their *VIF* reached only 1.00. Moreover, PCA showed that their items loaded on two distinct factors (team learning behavior items loaded .644 to .821 on one factor, and team performance items loaded .672 to .898 on the other factor). Given these indices, the chance of multicollinearity between team learning behavior and team performance is considered unlikely (Field, 2009). Second, team learning behavior and shared transformational team leadership behavior were also strongly related (r = .84). Their *VIF* reached a maximum of 5.19. PCA showed two distinct factors among the items (with Eigen values for team learning behavior ranging from .665 to .899, and for shared transformational team leadership from .510 to .885). One item of shared transformational leadership was excluded (i.e., 'My team members emphasize the value of questioning team members'), since it had a factor loading of .757 on the team learning factor and only .442 on the shared transformational leadership factor. After this exclusion, the correlation remained high (r = .82, as displayed in Table 4.1), but their *VIF* decreased to an acceptable 3.28. This indicated that multicollinearity between these variables is not expected (Field, 2009).

Hereafter, we conducted two sets of regression analyses to answer the research questions. Missing data on team age for three teams were substituted by the mean. First, we conducted a multiple linear regression analysis to test which leadership style and source was most supportive for team learning (RQ1). We also tested the assumption that team learning behavior mediates between team leadership behavior and team performance by running simple mediation analyses using ordinary least squares path analysis. Mediation is significant if the 95% bias-corrected confidence intervals, based upon 50,000 bootstrap samples for the indirect effect, do not include 0 (Hayes, 2013). Second, we conducted six separate series of moderator analyses as described by Hayes (2013), using PROCESS for SPSS version 2.16.3 as a computational tool. These series tested the moderation of task complexity on the influence of each team leadership style and source on team learning behavior (RQ2). If there was an interaction effect, task complexity was divided into two equal groups with the mean score as the cut-off point (i.e., low = < 5.62 and high = > 5.62) to specify the effect. Subsequently, an additional moderated mediation analysis via Hayes' (2013) PROCESS program tested whether a detected moderation effect of task complexity also moderated the indirect effect of team leadership behavior on team performance through team learning behavior.

RESULTS

Table 4.1 shows significant positive correlations between the shared transformational team leadership behaviors and team learning behavior (r = .82 for transformational; r = .66 for empowering; r = .58, p < .01 for initiating structure). Vertical transformational team leadership behaviors also correlated with team learning behavior (r = .49, p < .01). Furthermore, team size was negatively correlated with team learning behavior (r = -.39, p < .01) and shared transformational team leadership behavior (r = -.30, p < .05). Team age was negatively correlated with shared initiating structure (r = -.31, p < .05).

Multiple linear regression analysis (see Table 4.3) on the influences of all measured styles and sources of team leadership behavior on team learning behavior showed that only shared transformational leadership behavior predicts team learning behavior significantly (β = .567, p = .001, adj. R^2 = .642). This result corresponds to research question 1. Additional analyses tested the mediation of team learning behavior between team leadership behavior and team performance. The bootstrap confidence intervals for the standardized indirect effect in these separate mediation analyses showed that the team leadership behaviors vertical transformational (.202 to .687), shared transformational (.393 to .882), shared empowering (.300 to .795), and shared initiating structure (.249 to .701) significantly influence team performance through team learning behavior. The indirect effects of team leadership behaviors vertical empowering (-.122 to .469) and vertical initiating structure (-.004 to .487) are non-significant.

Table 4.3 Multiple lineair regression analysis of the effects of team leadership styles and sources on team learning behavior

	Team learning behavior				
	adj. R²	*F*(34)	*β*	*t*	*p*
	.642	10.427			.000**
(Constant)				1.886	.068
Team size			-.237	-2.006	.053
Team age			.046	.381	.705
Vertical transformational leadership			.283	1.813	.079
Vertical empowering leadership			-.126	-.772	.445
Vertical initiating structure leadership			.050	.445	.659
Shared transformational leadership			.567	3.454	.001**
Shared empowering leadership			.011	.043	.966
Shared initiating structure leadership			.090	.483	.632

Note. Standardized Beta's are reported.
N = 43 teams
p < .05*, p < .01** (two tailed)

Moderator analyses (displayed in Table 4.4) revealed that task complexity only moderates the relationship between vertical empowering team leadership behavior and team learning behavior (β = -.322, p = .011).

Table 4.4 Moderator effect of task complexity on the influence of vertical empowering team leadership on team learning behavior

	Team learning behavior				
	R^2	F(37)	β	t	p
	.348	3.954			.006**
(Constant)				.287	.775
Team size			-.395	-2.706	.010**
Team age			.055	.374	.710
Task complexity			-.007	-.050	.960
Vertical empowering leadership			.118	.871	.389
Vertical empowering leadership * Task complexity			-.322	-2.691	.011*
R^2 change due to interaction	.128				
F(37) *due to interaction*	7.241				
p	.011*				

Note. Reported coefficients are based on standardized variables
N = 43 teams
p < .05*, p < .01** (two tailed)

Specifically, vertical empowering team leadership behavior positively influences team learning behavior when task complexity is low (β = .559, p = .005). Vertical empowering team leadership behavior is insignificant for team learning when task complexity is high (β = -.219, p = .243). These results correspond to research question 2. Figure 4.2 presents a plot to interpret these interaction effects. To conclude, the bootstrap confidence interval for the conditional indirect effect of vertical empowering team leadership on team performance is significant when task complexity is low (.221 to .944) and insignificant when task complexity is high (-.528 to .151).

CONCLUSION AND DISCUSSION

This study examined what kind of team leadership behavior supports learning behavior of university teacher teams that are engaged in educational change issues. We included transformational, empowering, and initiating structure styles from vertical and shared sources of team leadership behavior. Our findings show that shared transformational team leadership behavior is most important for stimulating team learning behavior (RQ1). Vertical empowering team leadership behavior positively influences team learning behavior when team members perceive task complexity as low (RQ2).

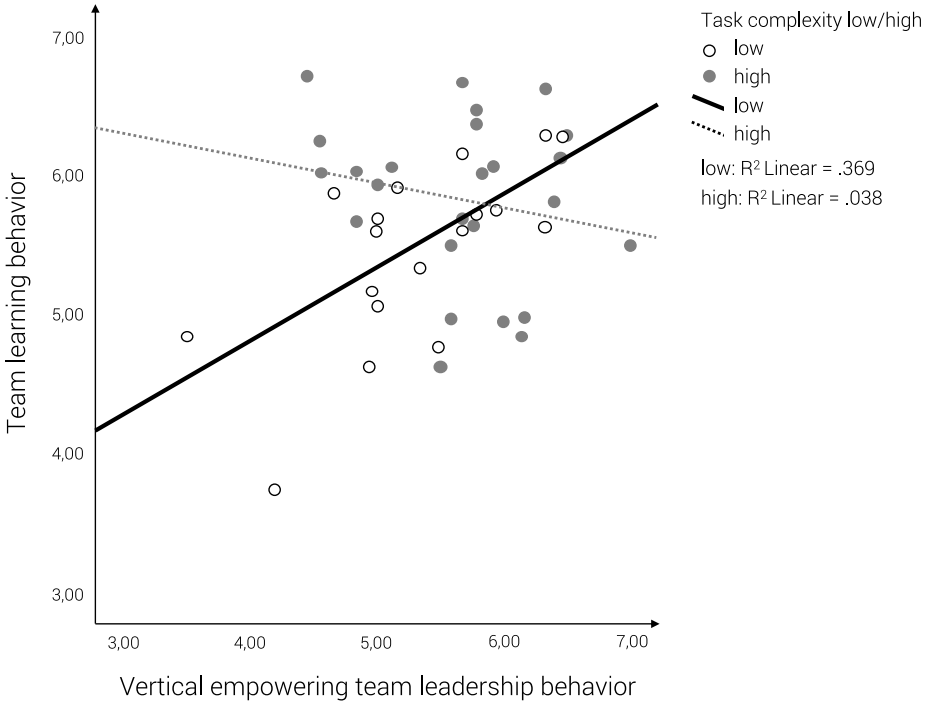

Figure 4.2 Plot of moderation effect of task complexity

These two main results contribute substantially towards understanding when leadership does indeed support teacher team learning behavior. We had the opportunity to compare the influence of six different types of team leadership behavior on team learning behavior. This allows us to enrich the current literature on team learning behavior, which rarely covers multiple types of team leadership behavior, relates team leadership behavior solely to team performance, and is largely conducted outside educational contexts (Koeslag-Kreunen, Van den Bossche et al., 2018). Our findings show that team leadership behavior characterized as "shared transformational" supported the learning behavior of university teacher teams the most. This finding adds a more detailed interpretation to multiple shared team leadership behaviors in higher education and its influence (e.g., Floyd & Fung, 2017). More specifically, challenging the status quo collaboratively and stimulating each other's intellect contributed very strongly to team learning behavior. Interestingly, the university teacher teams in our sample needed this mutual transformational support more than initiating structure or empowering styles and the support of their formal team leaders to take a chance on team learning behavior and overcome their habits of change-avoidence and working independently (Cox, 2004). As such, our finding is in line with previous research (e.g., Bucic et al., 2010), but most

importantly it shows that team members themselves should engage in behavior that keeps the team in motion. Leaders who overstructure the team process don't seem to help teams.

At the same time, our results show that the influence of empowering team leadership behavior on team learning behavior depends on perceived task complexity. This finding contributes towards understanding the moderating role of the specific team task in a higher education setting (Koeslag-Kreunen, Van den Bossche et al., 2018). Specifically, formal team leaders who empower teamwork were only important for team learning behavior if their teams perceived that their task was not complex, despite the need to work towards educational change. This confirms that university teachers do not necessarily recognize new elements in their task (e.g., Furco & Moely, 2012). Teams who perceive a low task complexity might sense that relying on existing knowledge and adapting or using known working methods will be enough to succeed (Ellström, 2001). However, these teams are at risk, because they are unable to recognize that they need each other's input and should interact and collaborate to develop new knowledge. Therefore, our findings show that it is essential that team leaders demonstrate behavior that encourages teamwork, interaction and the coordination of individual efforts at the team level.

LIMITATIONS, FUTURE RESEARCH AND IMPLICATIONS

This study examined the influence of six different types of team leadership behavior on team learning behavior. We controlled for team age and found that it was inversely related to shared initiating structure, which implies that younger teams focus more than older teams on structuring processes collaboratively. Similarly, Lorinkova, Pearsall, and Sims (2012) showed that team leaders' structuring behaviors support teams in the early stages and that empowering leaders are more important as the team processes evolve over time. We recommend similar longitudinal studies to specify which type of team leadership behavior is needed in which team phase to advance understanding of how to support team learning behavior over time. In doing so, we also recommend including perceived task complexity. Firstly, this should be done to detect what influences the task perception of team members. For example, we found that vertical transformational and shared empowering team leadership behaviors were related to task complexity, which suggests that these behaviors influence team member perception of task complexity. Secondly, we examined teams that needed to develop educational change, but it is unknown how task complexity influences leadership support in teams that only need to coordinate existing educational programs, and, as a result, do not need to develop new knowledge to succeed. For instance, future research can explore if perhaps more structuring team leadership behaviors prevent teams from building

new programs when no change is required, and save precious time and effort in the process.

Our results provide directions on how to support team learning behavior in university teacher teams responsible for working towards educational change. Not initiating structure, not empowering, and not having formal team leaders best supported team learning behavior. However, team members who challenge routines and encourage each other to seek alternatives supported each other in sharing unique ideas and expertise, co-constructing new knowledge and acting upon differences. This indicates that university teacher teams should not wait for directions from formal leaders who pave the way for them. Instead, it is our advice that they should overcome their routines themselves. At the same time, we revealed that not all university teacher teams automatically recognize that they need to work and learn together to develop new knowledge. For these teams, it is necessary that team leaders empower their learning behavior by emphasizing teamwork. Consequently, we conclude that bringing about educational change in higher education is a shared responsibility of team leaders and members.

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APPENDIX

Team construct measures

Team learning behaviors (Van den Bossche et al., 2006)

1. In this team, I share all relevant information and ideas I have
2. Team members are listening carefully to each other
3. If something is unclear, we ask each other questions
4. Team members elaborate on each other's information and ideas.
5. Information from team members is complemented with information from other team members
6. Team members draw conclusions from the ideas that are discussed in the team
7. This team tends to handle differences of opinions by addressing them directly
8. Comments on ideas are acted upon
9. Opinions and ideas of team members are verified by asking each other critical questions.

Transformational leadership (Pearce and Sims, 2002)

- Challenge to status quo

10. My team leader (members) isn't (aren't) afraid to "buck the system" if he/she (they) thinks (think) it is necessary.
11. My team leader (members) is (are) non-traditional type(s) that "shakes up the system" when necessary.
12. My team leader (members) isn't (aren't) afraid to "break the mold" to find different ways of doing things.

- Intellectual stimulation

13. My team leader (members) emphasizes (emphasize) the value of questioning team members.
14. My team leader (members) encourages (encourage) me to rethink ideas which had never been questioned
    before.
15. My team leader (members) questions (question) the traditional way of doing things.
16. My team leader (members) seeks (seek) a broad range of perspectives when solving problems.
17. My team leader (members) looks (look) at problems from many different angles.

Empowering leadership (Pearce and Sims, 2002)

- Encourage teamwork

18. My team leader (members) encourages (encourage) me to work together with other individuals who are part
    of the team.
19. My team leader (members) urges (urge) me to work as a team with other individuals who are part of the team.
20. My team leader (members) advises (advise) me to coordinate my efforts with other individuals who are part
    of the team.

Initiating structure (directive) leadership (Pearce and Sims, 2002)

- Assigned goals

21. My team leader (members) establishes (establish) my performance goals.
22. My team leader (members) sets (set) the goals for my performance.
23. My team leader (members) establishes (establish) the goals for my work.

- Instruction and command

24. When it comes to my work, my team leader (members) gives (give) me instructions on how to carry it out.
25. My team leader (members) gives (give) me instructions about how to do my work.
26. My team leader (members) provides (provide) commands in regard to my work.

Task complexity (Sarin and McDermott, 2003)

27. The product developed by our team was technically complex to develop.
28. Our team had to use non-routine technology to develop the product.
29. The development process associated with the product was relatively simple. [R]
30. Development of this product required pioneering innovation.
31. The product developed by our team is/was complex.

Team performance (Hackman, 1987, 1989)

32. This team meets or exceeds its customers' the expectations.
33. This team does superb work.
34. I am satisfied with the performance of our team.
35. We have completed the task in a way we all agree upon.
36. I would want to work with this team in the future.
37. As a team, we have learned a lot.

5 HOW TEAM LEADERS THINK: LEADERSHIP PERSPECTIVES AND TEAM FACTORS IN TEAM LEADER COGNITIONS

ABSTRACT

The importance of teamwork has increased continuously. This changing way of organizing work urges team leaders to be adequately trained to support interpreting team situations and to apply behavior that is favorable in that specific context. More diversified cognitions can help team leaders to do so. However, team leader cognition is understudied since team leadership research is mostly examined from a behavioral viewpoint. Interviews with 15 team leaders were conducted to elicit team leader cognitions. We explored which leadership perspectives (i.e., personal dominance, interpersonal influence, relational dialogue) and team factors (i.e., team learning behavior, interpersonal learning factors, task features, team leadership behavior) team leaders hold. Team leader cognitions appeared to vary widely. Team leaders with a high cognitive diversity perceived leadership as personal dominance, interpersonal influence and relational dialogue and used many different team factors. This was in contrast to team leaders with a low cognitive diversity, who viewed team leadership only as personal dominance and interpersonal influence and used a very limited number of team factors. Our results indicate that team leaders who hold more different leadership perspectives are also able to use more diverse team factors that determine their specific team situation. It is suggested that increasing cognitive diversity can make it easier for team leaders to interpret and adapt to their specific team situation effectively, for example by making more use of team member expertise and influence instead of solely viewing leadership as a one-way influence, regardless of the specific team context.

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Koeslag-Kreunen, M., Van den Bossche, P., Van der Klink, M. R., & Gijselaers, W. H. (under review). How team leaders think: Leadership perspectives and team factors in team leader cognitions.

Growing specialization and the increasing complexity of problems at work has led to a strong presence of teams in today's organizations (Kozlowski & Ilgen, 2006). Teams can bring about advanced knowledge and adapt to ambiguous situations if professionals integrate their specialized expertise at the team level (Kozlowski & Ilgen, 2006). This changing way of organizing work urges team leaders to be adequately trained in making them aware about their role in interpreting team situations and leading teams (Day & Harrison, 2007). This requires paying explicit attention to training of team leaders, because it takes more than work experience to interpret team situations from a leadership perspective (Rupprecht, Strasser, Gruber, and Harteis, 2010).

Team leaders typically operate in a dynamic situation and need to consider multiple factors to interpret their situation (Rupprecht et al., 2010). Early research by Wood and Bandura (1989) demonstrated that leadership behavior in complex work environments depends on how leaders think and interpret situations as the consequence of an ongoing interplay between the leader's cognitions, behaviors, and the particular context the leaders operates in. Later onwards, it was found that holding diversified cognitions made it easier for leaders to use, recognize and integrate different leadership perspectives on the situation they were in (Hooijberg, Hunt, & Dodge, 1997). Cognitive diversity enabled leaders to interpret team situations, judge whether it was necessary to make a change and to apply behavior that is favorable in that specific situation (Hooijberg et al., 1997).

More recent research has consistently demonstrated the importance of team leader behavior in team settings which require sharing and integrating team members' expertise (Burke et al., 2006). Leaders have the capacity to create the necessary conditions within teams for sharing and integrating expertise (Burke et al., 2006). A team is here defined as "a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems" (Cohen & Bailey, 1997, p. 241). Research on teams has focused on a variety of conditions (e.g. team composition) and variables (e.g. team conflicts) influencing team processes and team outcomes (Kozlowski & Ilgen, 2006). It has been found that understanding how teams perform, requires understanding its underlying team processes. Team learning behavior has been identified as one of the most important team processes determining team performance (Kozlowski & Ilgen, 2006). Team learning behavior is about integrating different ideas and opinions at the team level, which yields new shared knowledge (Van den Bossche et al., 2006). Teams do not easily engage in team learning behavior when it gets to sharing expertise, or trying to integrate their expertise when team conditions do not allow them to do so (Van den Bossche, Gijselaers, Segers, & Kirschner, 2006). There is abundant evidence that team members are not willing to share knowledge when they don't trust others, don't perceive sufficient team efficacy, or when they

don't feel safe to speak up and mention opposing views (Edmondson, 1999; Lee, Gillespie, Mann, & Wearing, 2010).

One can make a distinction between conditions which are decisive on the social nature of team work (trust, safety, efficacy), and on conditions which specify the nature of the team task (in terms of level of routine, complexity, interdependence, and novelty). A recent study by Koeslag-Kreunen, Van den Bossche, Hoven, Van der Klink, and Gijselaers (2018) showed that deciding which specific team leadership behavior is effective for team learning behavior highly depends on the team's task. They found that structuring processes supports learning behavior in teams with low-complex task (such as reinforcing routines), whereas learning behavior in teams with high-complex (such as developing change) is supported by encouraging creative processes (Koeslag-Kreunen et al., 2018). Furthermore, these team leadership behaviors are not restricted to just the formal team leader but can also be shared among team members (Pearce & Sims, 2002). Moreover, Day, Gronn, and Salas (2004) reasoned that team leaders should utilize and integrate all team members' expertise when performing complex team tasks that are not prestructured and for which no single leader is able to provide all the necessary answers. In short, there are different ways in which team leaders can support teams, whereby the team task influences which specific style is most beneficial (Koeslag-Kreunen et al., 2018). Accordingly, team leaders who only hold a traditional view on leadership as a one way, top-down influence regardless of the specific team situation is no longer sufficient (Day & Harrison, 2007). Raelin (2017) reasoned that such an individual leadership approach does not take the specific situation into account. In the same vein, Day et al. (2004) plead for a collective view on leadership that respects the specific team situation in actions and builds on and extends the influence of all team members.

As a result, team leaders need to hold various leadership perspectives and team factors in their cognitions to interpret team situations and to adapt to that specific situation meaningfully (Hooijberg et al., 1997). But the question remains whether team leaders do indeed recognize this as well. This study aims to empirically address this question because there is a shortage of research that specifies team leader cognitions (Day, Harrison, & Halpin, 2009; Rupprecht et al., 2010). Team leadership is mostly examined from a behavioral viewpoint (Burke et al., 2006), and empirical studies on cognitions mainly appear in traditional leader-follower studies instead of leadership in teams (Day, Fleenor, Atwater, Sturm, & McKee, 2014). In addition, Schyns, Kiefer, Kerschreiter, and Tymon (2011) reasoned that traditional training programs of leaders seem to emphasize behaviors of single leaders without paying attention to how leaders think about leadership and interpret their situation, and, as such, do not (yet) align with a collective view on leadership. For these reasons, we explore which cognitions team leaders consider when viewing team situations. This study aims to provide in-depth

information on team leader cognition and contribute towards a cognitive turn in team leadership research. Our findings can offer new directions for team leader training on how to provide meaningful support for their teams.

TEAM LEADER COGNITIONS

It is argued that the behavior of team leaders is guided by the way they think and how they interpret situations as a reciprocal interplay between cognitions, behavior and context (Wood & Bandura, 1989). Hence, understanding of the behavior of team leaders requires an observation of not only their behavior, but also their cognitions on how they think and interpret team situations. Team leader cognitions can be defined as knowledge structures that represent how team leaders (1) perceive leadership and (2) interpret their specific team situation. These two building blocks follow the reciprocal interplay between cognitions, behavior and context of Wood and Bandura (1989). We integrated leadership perspectives as conceptually driven and team factors as stimuli-driven knowledge structures to conceptualize team leader cognition. This approach is inspired by Hodgkinson (2003) who reasoned that individual work behavior is influenced by conceptually driven and stimuli-driven structures in information processing. Conceptually driven structures means that individuals simplify and structure the situation based on their mental representations, developed from past experiences and learning (Hodgkinson, 2003). Hodgkinson (2003) defined mental representations as individuals' internal knowledge and understanding about their work, such as schemata and mental models that serve as advanced organizers to guide behavior. For leaders specifically (DeRue & Meyers, 2014), mental representations can be seen as their thoughts upon leadership as reflected in, for example, self-concepts or identity as a leader (e.g., how one thinks of oneself as a leader; Lord & Hall, 2005), implicit leadership theories (e.g., images about traits and behaviors of leaders; Schyns et al., 2011), or leadership structure schemata (e.g., leadership perspectives; Drath, 2001). Mumford et al. (2017) found that such leadership thoughts can guide leader behavior.

In addition, Hodgkinson (2003) included stimuli-driven structures to make sense of the situation through the key context factors individuals consider. This information process also structures the situation mentally and guides individuals' work behavior subsequently (Hodgkinson, 2003). In the context of teams, research revealed various key factors, such as team learning behavior (Van den Bossche et al., 2006), that team leaders can use to determine their specific team situation. Hodgkinson (2003) argued that conceptually driven and stimuli-driven information processing need to be combined to structure information and guide behavior; for instance, to prevent one leadership perspective prevailing regardless of the specific situation. In line with this reasoning, this study defines team leader cognitions

as knowledge structures that represent how team leaders perceive leadership and interpret their specific team situation.

Leader-follower research shows that leader cognitions can vary and may lead to differences in leader effectiveness (Mumford et al., 2017). Hooijberg et al. (1997) posited that diversified leader cognitions lead to a better performance, because these leaders are able to use, recognize and integrate different leadership perspectives and factors when perceiving and interpreting their environment. They argued that this cognitive diversity makes it easier to judge the situation and apply behavior that is favorable in that specific situation. To explore team leader cognitions, the present study specifically focuses on which leadership perspectives and team factors they consider.

LEADERSHIP PERSPECTIVES

One of the ways to examine how leaders perceive leadership is through identifying their leadership perspectives (Day & Harrison, 2007). Leadership perspectives are defined as the understanding of what leadership is (Sessa et al., 2016) and can be used to describe different complexity levels for thinking about leadership (Hooijberg et al., 1997). Specifically, Lord and Hall (2005) proposed that leaders develop different views on their role, shifting from the individual (focused on themselves) to the relational level (taking others into account) and ending at the collective level (participating in the dynamics). Drath (2001) distinguished personal dominance, interpersonal influence, and relational dialogue as three leadership perspectives to identify how leaders perceive leadership. We add a team context to describe Drath's (2001) perspectives. *Personal dominance* views leadership as something that belongs to the leader, who provides direction, instructions and comments to the team. *Interpersonal influence* develops from personal dominance and sees leadership as the reciprocal interaction between the leader and the team, meaning that the leader takes the input of the team into account in his/her actions. *Relational dialogue* means that leadership is a process that emerges within the team. As such, it does not replace the former perspectives, but adds that all team members can be leaders and that a formal leader participates in the process as a team member (Sessa et al., 2016).

Day and Harrison (2007) used these leadership perspectives to distinguish an individual (i.e., personal dominance), relational (i.e., interpersonal influence) and a collective (i.e., relational dialogue) conceptualization of leadership. These views increase in complexity because they increase in terms of interaction levels, from one-way from the leader to the team, to two-way between the leader and the team, and then a dynamic process within the team (Day & Harrison, 2007). It appears that the leadership perspectives of Drath (2001) can be detected in leaders' general view on leadership and their view on their own leadership (Zaar, Van den Bossche,

& Gijselaers, 2017). DeRue and Myers (2014) argued that a general leadership perspective can influence leaders' actions in developing themselves to become more or less like that prototypical view, and that the perspective on the self as a leader can guide leaders in how they act in practice (DeRue & Myers, 2014). Moreover, possessing more complex leadership perspectives may support leader effectiveness, since team leaders can rely on more alternatives to decide which perspective suits their specific team situation (Hooijberg et al., 1997). For example, considering relational dialogue may facilitate team leader awareness of the possibility of increasingly using team member knowledge and influence for more complex tasks, instead of solely relying on personal dominance that neglects team member influence (Day et al., 2004).

TEAM FACTORS

To detect team leader cognitions that represent how team leaders interpret their specific team situation, we select four team factors: team learning behavior, task features, interpersonal learning factors and team leadership behavior. These factors are centered on team learning and leadership as very important drivers for achieving team effectiveness (Burke et al., 2006; Decuyper, Dochy, & Van den Bossche, 2010; Edmondson, 1999; Koeslag-Kreunen et al., 2018; Kozlowski & Ilgen, 2006). *Team learning behavior* is defined as team members' interactive and reflective discourse activities that take place at a team level (Edmondson, 1999). Decuyper et al (2010) identified six team learning behaviors: (a) *sharing* knowledge and ideas with each other; (b) *co-construction* by building on what is shared; (c) engaging in *constructive conflicts*, such as discussing differences; (d) *team reflection* (reflexivity) on processes and goals; (e) *team activity* (e.g., experimenting); and (f) *boundary-crossing* by seeking external information. These behaviors can build new, shared meanings, which enable the development of new knowledge (Van den Bossche et al., 2006). Team leaders' ability to recognize learning behavior in their teams may guide their actions. For example, team leaders can emphasize that different perspectives are desired to make it easier for team members to express their opinions (Koeslag-Kreunen et al., 2018).

In addition, not all team tasks require innovative solutions. A task can be defined by its: (a) *interdependency* (i.e., whether team members need each other's input; Johnson & Johnson, 2003); (b) *novelty* (i.e., the amount of unknown elements; Hoegl, Parboteeah, & Gemuenden, 2003); (c) *structure* (i.e., whether goals and methods are prescribed in detail or open to interpretation; Ellström, 2001); (d) and *complexity* (i.e., level of difficulty and absence of standard solutions; Cooke, Kiekel, & Helm, 2001). Tasks with low interdependence, novelty, complexity and high structure may reinforce routines for which only sharing can be enough (Koeslag-Kreunen et al., 2018). On the contrary, tasks with high interdependence,

novelty, complexity and low structure require also the co-construction of new knowledge to develop innovative solutions. Team task awareness can make it easier for leaders to decide how to support team learning behavior specifically (Koeslag-Kreunen et al., 2018). For example, leaders of teams with high complex tasks may increase the influence of all team members because they are no longer able to provide the required answers themselves (Day et al., 2004).

Team learning behavior is also supported by *team psychological safety* (i.e., mutual trust and respect; Edmondson, 1999) and *team efficacy* (i.e., shared belief in team capability; Decuyper et al., 2010). These conditional interpersonal learning factors support taking risks and overcoming problems when there is a difference of opinion (Decuyper et al., 2010). For instance, team leaders who recognize the absence of these factors may purposefully promote a positive atmosphere for open interaction and discussion to build team psychological safety (Edmondson, 1999; Lee et al., 2010).

Finally, team leaders can support team learning behavior essentially through three styles, namely transformational, empowering and initiating initiating structure (Koeslag-Kreunen et al., 2018). *Transformational team leadership behavior* means moving teams beyond their known practices by expressing a challenging vision, stimulating members to seek alternatives and handling concerns (Burke et al., 2006). *Empowering team leadership behavior* involves developing team members' self-management skills by encouraging teamwork and shared decision-making (Burke et al., 2006). *Initiating initiating structure team leadership behavior* is focused on structuring team processes through specifying team methods and objectives (Burke et al., 2006). These three styles can stem from the team leader as well as the team members (Pearce & Sims, 2002), and the latter is also referred to as a shared team leadership behavior that is comparable with the relational dialogue leadership perspective (Day & Harrison, 2007). Knowing these three styles can make it easier for team leaders to decide which team leadership behavior is most supportive in a specific team situation, instead of solely focusing on one single style. For example, deciding to initiate structure to support team learning for routine, or applying transformational behavior to support team learning for innovation (Koeslag-Kreunen et al., 2018).

In sum, the present study explores team leader cognitions by identifying how team leaders perceive team leadership and interpret their specific team situation. In doing so, we focus on team leader leadership perspectives and team factors. It is assumed that considering diversified leadership perspectives and team factors can make it easier for team leaders to judge whether it is indeed necessary to make a change and to apply behavior that is promising for that specific situation (e.g., Hooijberg et al., 1997). We explore which leadership perspectives and team factors team leaders consider in their cognitions when viewing team situations.

METHOD

Semi-structured interviews were conducted with 15 team leaders to elicit team leader cognitions.

SAMPLE AND SETTING

The team leaders in this study worked at a Dutch higher professional educational intitute with a focus on teaching and practice-based research for professional practice. This institute uses a team approach for dealing with complex problems. The team leaders were formally appointed to lead a team of professionals with high levels of expertise that deal with an innovative task, such as designing new programs for learning how to work how to work in an interprofessional context. This context may offer opportunities to detect multiple leadership perspectives and team factors. Each team corresponded to the team definition of Cohen and Bailey (1997). Providing a minimum of interaction experiences, the teams had a minimum age of two months and had between 3 and 20 members.

The team leaders in this study were part of a larger sample that was involved in a quantitative study examining which team leadership behavior best supports team learning behavior. Fifteen team leaders were purposefully selected because they (a) had a wide range of scores on various team factors (e.g., team learning behavior), and (b) covered various domains (i.e., arts, business and economics, education, health care, law and management, research and development, social studies, and technology). The identified team leaders were contacted by the first author. The team leaders verified the selection criteria and were all willing to participate. The team tasks included starting up a new bachelor program for professionals; developing new curricula; redesigning undergraduate programs; conducting new multidisciplinary research; and developing and implementing a new management strategy, new (digital) course material, and novel assessment forms. The age of the participants (5 female, 10 male) ranged between 37 and 64 years (M = 49, SD = 8.45). They had been working at the institute for an average of 17 years (*Min.* = 3, *Max.* = 41, SD = 11.26). Their experience of being a leader varied from 1 to 40 years (M = 12.57, SD = 11.16). Their teams had between 3 and 21 members (M = 7, SD = 5.28) and the team ages ranged between 2 and 15.50 years (M = 3.80, SD = 3.32).

ELICITATION TECHNIQUES

Team leader cognitions were identified by exploring how they perceived team leadership (i.e., leadership perspectives) and how they interpreted a situation (i.e., team factors). Four different elicitation techniques were used to facilitate elicitation of these cognitions. We used this diversity of approaches to enhance the disclosure of knowledge that team leaders may not have made explicit before, of which they

were unaware, or was difficult to express (Cooke, Stout, & Salas, 2001; Eraut, 2000). After each approach, the team leaders were asked if they wanted to add more information on the discussed topic. The first two techniques identified the *leadership perspectives* and the third and fourth technique detected the *team factors* they used.

First, we asked how they perceived leadership in general (i.e., general leadership perspective). Sample question: 'What is leadership to you?' Starting with a broad question supports elicitation without hinting or guiding responses (Cooke, Stout et al., 2001). Second, we asked them to describe a metaphor that best captured their own team leadership (e.g., Cairns-Lee, 2015). Following Eraut (2000), using such an approach enhances the explication of knowledge of their own leadership role (i.e., self-leadership perspective). Sample question: 'What metaphor represents your team leadership?'

Third, we evoked retrospective thoughts upon their own team situation (Cooke, Stout et al., 2001). We showed each team leader their score per team leadership style (i.e., transformational, empowering and initiating structure) as observed by the team members (aggregated on team level). These scores were gathered during a previous survey-based study (scales adopted from Pearce and Sims, 2002). Sample items: "My team leader is a non-traditional type who 'shakes up the system' when necessary" (*transformational*, 8 items, α = .94), "My team leader encourages me to work together with other individuals who are part of the team" (*empowering*, 3 items, α = .87), and "When it comes to my work, my team leader gives me instructions on how to carry it out" (*initiating structure*, 6 items, α = .90). The team leaders were asked to share their thoughts upon each of the three scores (that were accompanied with definitions, standard deviations and the average score of the total sample of 52 teams), and how they would explain that score. Sample question: "What do you think about this score? Can you explain this observation?" Using team member observations makes it easier to retrieve team leaders' personal stored information about their team's situation (Cooke, Stout et al., 2001).

Fourth, we presented new team situations to offer another opportunity to evoke which team factors they used when interpreting team situations (Cooke, Stout et al., 2001). For this purpose, we used vignettes about teamwork (Cappel, 2008). We showed two distinctively different cases of university teacher teams adopted from Benjamin (2000). We selected the "Biology teaching team" (Benjamin, 2000, p. 196-197) and the "Law teaching team" (Benjamin, 2000, p. 199-200), which in the current study are referred to as "case A" and "case B", respectively. Case A concerned a team that distributed their tasks among the individual team members, who hardly worked and learned together to develop their education. In contrast, team members in case B worked and learned together as a team and critically improved their education as a collective. These cases served as cues to evoke team leader team factors (Cooke, Stout et al., 2001). We selected these cases to ensure that

these vignettes were both standardized and meaningful representations for the participants to evoke their team leadership factors. The cases were translated from English into Dutch by a translation office via translation-backtranslation. The team leaders received the cases during the interview, accompanied by a short description: "These teams shared the responsibility to develop and teach a subject to students. These teams were all teaching large first-year courses, and the teams comprised lecturers, tutors and a subject coordinator" (Benjamin, 2000, p. 194). After reading each case, team leaders were asked to share their thoughts and to indicate what they would do if they led that team. Sample question: "What do you think about this team? What would you do if you were their team leader?"

PROCEDURE

A week before the interview was planned, the team leader was asked to prepare by thinking about a metaphor that represented his/her team leadership, such as an animal, a picture or a symbol. The interviews started with an introduction of the topic and procedure, and permission was obtained for audiotaping. Each interview took one hour and was transcribed verbatim. At the end of the interview, the participants were invited to reflect briefly upon how they experienced the interview. The participants checked their interview transcript for accuracy. Finally, the participants were invited to reflect on a summary of their interview (resulting in no comments) to support internal validity (Miles & Huberman, 1994).

CODEBOOK

The codebook was developed based on the definitions outlined in the theoretical framework. The codes were divided into two main code groups: (a) *leadership perspectives*: metaphor, general and self-leadership perspectives, and (b) *team factors*: team learning behavior, task features, interpersonal learning factors, and team leadership behavior. The first four lines of Table 5.1 show the used main and sub-codes.

CODING PROCESS

The transcripts and the codebook were imported into the software program Atlas.ti™ (version 1.5.3), which was used to detect and code meaningful segments. A meaningful segment consisted of an interviewee's response that related to one of this study's topics, which could be a sentence, part of a sentence or a set of related sentences. Hsieh and Shannon's (2005) directive content analysis was used for coding in two rounds: (a) for detecting meaningful segments, appointing main codes and testing the codebook, and (b) for appointing sub-codes using the refined codebook. First, a trained coder and the first author detected meaningful segments in six transcripts and appointed main codes to those segments

independently. Differences regarding the detected meaningful segments and codes were discussed until a consensus was reached. This round of double-blind coding 40% of the total data set resulted in a sufficient Cohen's kappa of .72. Revisions to the codebook were made. Second, the first author detected meaningful segments in all transcripts and coded them based on the revised codebook. Another independent coder who was not previously involved was trained in using the codebook. She assigned sub-codes to the meaningful segments in seven transcripts that were not involved in the first round independently. Differences regarding the codes were discussed until a consensus was reached. This process of double-blind coding another 47% of the total data set resulted in a substantial Cohen's kappa of .68.

DATA ANALYSIS

In total, 503 meaningful segments were deductively coded based on the theoretical framework (the segment frequency per code is presented in Table 5.1) and 67 segments were inductively assigned to new codes, which were not analyzed further. These new codes mostly concerned segments on being student or teacher-centered (N = 39), as pronounced in the cases literally; or concerned applying other team leadership behaviors in the cases (N = 25), such as including students or starting individually (for case A) or creating facilities to sustain the way of working and showing appreciation (for case B).

Next, we conducted an in-depth content analysis of the 503 segments per code. Most segments concerned team leader self-leadership perspectives (N = 139) and task features (N = 145), in contrast to team learning behavior (N = 49) and interpersonal learning factors (N = 12), as presented in Table 5.1. Then, we analyzed which of the leadership perspectives occurred in the general and self-leadership perspectives per team leader. Subsequently, we analyzed which team factors they mentioned. The leadership perspectives appeared to vary highly between the team leaders. Just one team leader held the same perspective (i.e., interpersonal influence) for both the general and the self-leadership perspective. All other 14 team leaders (93%) held a personal dominance and an interpersonal influence perspective for the general and/or the self-leadership perspective. Five of them (33%) also held the relational dialogue perspective for both the general and the self-leadership perspective. These key differences presented three groups: (a) no relational dialogue perspective (N = 3; 20%); (b) relational dialogue for the general *or* self-leadership perspective (N = 7; 47%); and (c) relational dialogue for the general *and* self-leadership perspective (N = 5; 33%).

The segments within each group displayed that these groups viewed team leadership differently. Essentially, group A viewed team leadership as adapting to the team; group B had the same view, but also added greater emphasis on the interaction between the leader and the team; and group C held parallel views, but

also had a collective view on team leadership. Furthermore, an analysis of the identified team factors per group showed that the groups differed with regard to their level of cognitive diversity (i.e., various leadership perspectives and team factors). Based on these differences, we labeled groups A, B and C as “adaptive team leaders with low cognitive diversity”, “interactive team leaders with medium cognitive diversity”, and ”collective team leaders with high cognitive diversity”, respectively, where “low” represents considering a minimum, “medium” a moderate, and “high” a maximum percentage of leadership perspectives and team factors per group (see Table 5.1).

Table 5.1 Total number of segments per code and summary of three groups of team leader cognitions

	Segments of team leader cognitions (*N* = 503)																						
		Leadership perspectives (*N* = 202)						Team factors (*N* = 301)															
		General (*N* = 63)			Self (*N* = 139)			Team learning behavior (*N* = 49)						Task features (*N* = 145)				Interpersonal learning factors (*N* = 12)		Team leadership behavior (*N* = 95)		
	Leadership view and level of cognitive diversity	Personal dominance (*N* = 37)	Interpersonal influence (*N* = 14)	Relational dialogue (*N = 12)*	Personal dominance (*N* = 45)	Interpersonal influence (*N* = 62)	Relational dialogue (*N* = 32)	Sharing (*N* = 14)	Co-construction (*N* = 5)	Constructive conflict (*N* = 10)	Team reflexivity (*N* = 12)	Team activity (*N* = 1)	Boundary-crossing (*N* = 7)	Interdependency (*N* = 36)	Novelty (*N* = 39)	Structure (*N* = 69)	Complexity (*N* = 1)	Team psychol. safety (*N* = 6)	Team efficacy (*N* = 6)	Transformational (*N* = 57)	Initiating structure (*N* = 25)	Empowering (*N* = 13)
a	**Adaptive** team leaders with **low** cognitive diversity	+	+	-	+	+	-	+	+/-	-	+/-	-	-	++	++	++	-	-	+/-	+	+/-	-
b	**Interactive** team leaders with **medium** cognitive diversity	++	+	+/-	++	++	++	+	+/-	+/-	+/-	-	+	++	++	++	-	+/-	+/-	++	++	+
c	**Collective** team leaders with **high** cognitive diversity	++	+	++	+	++	++	+	+/-	++	++	+/-	+	++	++	++	+/-	+	-	++	+	+

Note: Percentage of team leaders within this group that mentioned this code: - = none, +/- = minimum (1 to 39%), + = moderate (40 to 69%), ++ = maximum (70 to 100%).

RESULTS

We explored leadership perspectives and team factors in team leader cognitions. Their cognitions appeared to vary highly, which led to three groups with different levels of cognitive diversity (low, medium, high). Table 5.1 presents the summary of the in-depth content analyses per group, showing the identified leadership perspectives and team factors per group (including percentages). Each group is described below.

ADAPTIVE TEAM LEADERS WITH LOW COGNITIVE DIVERSITY

This group of team leaders perceived team leadership as adapting to the team and had a low cognitive diversity of leadership perspectives and team factors.

LEADERSHIP PERSPECTIVES

These team leaders only held personal dominance and interpersonal influence perspectives; relational dialogue was not present. Personal dominance and interpersonal influence perspectives in their *general view* reflected team leadership as a person with a strong motivation who wants to get the most out of the people and adapts his/her behavior to the members' diversity, for example:

> *"When I think about team leadership, the first thing that comes to mind is someone with a full conviction, (…) who wants to invest based on some sort of idealism and based on goals that are very clear to him. Related to a big social empathy and communication skills, but also that conviction, that strong motivation." (10:1)*

Their *self-leadership perspectives* described that they delegated outcome responsibility to team members, monitored team member actions and intervened by telling them what to do next or to take decisions, as reflected by this quote:

> *"I know that I don't have to be a very active leader, but more of a controlling leader, so to say." (10:8)*

In addition, this group described that they adapted their behavior to their team members' needs and skills, such as:

> *"On reflection, (…) I am trying to adapt to, or to align with, the kind of people at the table." (3:1)*

TEAM FACTORS

This group did not use many team factors. Team learning behaviors were hardly present and mostly occurred while reflecting on case B by mentioning sharing and some reflexivity. These team leaders used task interdependence, novelty, and structure often. Team efficacy was the only interpersonal learning factor and was

hardly mentioned. Additionally, they had no idea what they would do as a leader in both cases, or they mentioned mostly transformational and some initiating structure team leadership behaviors.

INTERACTIVE TEAM LEADERS WITH MEDIUM COGNITIVE DIVERSITY

This group of team leaders viewed team leadership as adapting to the team and to the interaction within the team and had a medium cognitive diversity of leadership perspectives and team factors.

LEADERSHIP PERSPECTIVES

These team leaders perceived team leadership as personal dominance and interpersonal influence. They also held some relational dialogue in their general and/or self-leadership perspective. They mostly held personal dominance and interpersonal influence as their *general leadership perspective*. They stated that team leadership is about inspiring team members, being an expert, setting frameworks, taking informed decisions, coaching team members, and knowing team members' skills, as these quotes exemplify:

> *"I like it if I can determine things myself. It gives me a kick, because I have achieved something, or done something, or invented something myself. And when a leader says 'wow, that is nice', or 'interesting', that is very supportive. That you receive appreciation for the things you do." (7:4)*

> *"But to create space, you need to have frameworks. And I think that that is something that is often forgotten. Leadership does not mean 'just do something nice and I will facilitate it'. No, it is about being very clear on what the boundaries are." (17:2)*

The limited references to relational dialogue in their *general perspective* reflected leadership as something that belongs to all team members, for example:

> *"Simply put, leadership is ownership. Leadership does not belong to me. Leadership is not owned by a team leader. No, leadership belongs to everyone who works here." (17:13)*

In this group's *self-leadership perspective*, team leadership was viewed from a personal dominance and interpersonal influence perspective and described as knowing what you want, being clear on expectations through dialogues, and offering space for team members to interpret and change the expectations. Sample quote:

> *"The hardest part of water color painting is that the colors blend. You are not in full control of that process, because the water, the paint, and the colors are no longer attached to your paintbrush and make a pattern themselves. (…) This also happened in this team. The paint moved in different*

> *directions, so you needed to make adjustments and set clear boundaries to let the paint move in the right direction." (1:2)*

In addition, relational dialogue was sometimes present in this group's *self-leadership perspective*. These segments represented team leadership as an equal and rotational shared responsibility, for example:

> *"It is just about exploring together: 'what road shall we take?'" (7:11)*

TEAM FACTORS

This group used a limited team factor variety. The team learning behaviors of sharing, co-construction, constructive conflict, team reflexivity and boundary-crossing were moderately present and were used to explain transformational and empowering leadership scores, and while describing the cases. Task interdependence, novelty, and structure were frequently used. Team psychological safety and team efficacy were scarcely mentioned. Additionally, these team leaders mostly applied transformational and initiating structure and some empowering team leadership behaviors to the cases.

COLLECTIVE TEAM LEADERS WITH HIGH COGNITIVE DIVERSITY

This group of team leaders viewed team leadership as adapting to the team, as interaction within the team and operating as a collective, and had a high cognitive diversity of leadership perspectives and team factors.

LEADERSHIP PERSPECTIVES

These team leaders perceived team leadership as personal dominance, interpersonal influence, and relational dialogue in their general *and* self-leadership perspectives. Personal dominance and interpersonal influence perspectives within their *general perspective* represented team leadership as being a role model, inspiring team members, being an initiator, and as something that you can earn or that you have naturally, as reflected by this statement:

> *"You are some kind of a generator who starts things, or initiates things, or prepares some extra support and skills." (8:2)*

In addition, the relational dialogue codes in their *general perspective*, reflected team leadership as something you do together that it is not limited to one person, such as:

> *"Leadership is being part of the collective. I like it if leaders are really a part of the team. Not from a hierarchical position, but in between." (8:2)*

This group's *self-leadership perspective* with segments on personal dominance and interpersonal influence showed that this group perceived his/her own team

leadership as something that adapts to the team's progress and talents, focusing on connecting individual members to the team, and providing space within a certain framework, as mirrored by this quote:

> *"Everyone has their own expertise, their own knowledge and discipline. You should provide autonomy for that. But the framework needs to be clear for everyone. And that is the role of a team leader. He draws the lines that you determine together, of course, but also checks every now and then: 'Does everyone still follow these lines, are they clear to everyone, and are the expectations clear for everyone?' But most importantly, it is something collaborative." (18:5)*

The relational dialogue segments within this group's *self-leadership perspective* reflected team leadership as a process of connecting and seeking alignment together, for example:

> *"Alignment is the formal expression; connecting the wires in numerous ways. Because strictly speaking, an organization is just the same as a society of people who are doing things together. Nothing else. So, it is by the grace of the people that they are connected. And if that connection, that interaction is right, then you can work together. Then you can develop trust that works, by having strong discussions, because you know: 'This is constructive'." (2:11)*

Furthermore, the relational dialogue segments within the *self-leadership perspective* reflected their team leadership as something that you do together as a shared responsibility by taking shared decisions and exploring together, as reflected by this quote:

> *"Just let me start, and then we will explore together, instead of me mapping the terrain beforehand to see what can go wrong. Because that does not bring us anywhere, of course." (14:21)*

TEAM FACTORS

These team leaders used a wide team factor variety. Team learning behaviors were mentioned often, mostly as an explanation of empowering scores and in describing cases A and B. Task interdependence, novelty, structure and task complexity were frequently used. Some team psychological safety was used as an interpersonal learning factor. This group mentioned all three team leadership behaviors to apply to the cases, representing a mix of styles – mostly transformational, moderately empowering, and some initiating structure.

CONCLUSION AND DISCUSSION

This study explored leadership perspectives and team factors in team leader cognitions when viewing team situations. Our findings illustrate that team leader cognitions vary highly, as illustrated by three groups: (a) adaptive team leaders with low cognitive diversity, (b) interactive team leaders with medium cognitive diversity, and (c) collective team leaders with high cognitive diversity. Per group, the cognitive diversity seemed to increase from adaptive, to interactive, and then collective team leaders. Adaptive team leaders used a limited diversity of leadership perspectives and team factors. Interactive team leaders appeared to exceed but not replace the team leadership cognitions of adaptive team leaders. Collective team leaders exceeded the cognitions of interactive team leaders, as they added even more diverse leadership perspectives and team factors.

These findings align with Day and Harrison (2007) who suggested an increase of leadership views in three complexity levels, representing personal dominance as a basic level, personal dominance and interpersonal influence as a medium level, and personal dominance, interpersonal influence and relational dialogue as a high level. They argued that a basic level includes fewer factors and less complex notions of leadership (e.g., viewing leadership as an individual influence), in contrast to the medium and high levels of leadership conceptualization, which increasingly include more factors and more complex notions of leadership (e.g., viewing leadership as multi-level influences). Our findings add novel empirical confirmation that team leaders who include diverse leadership perspectives also use and recognize more varied team factors in their cognitions. For example, we showed that adaptive team leaders considered solely personal dominance and interpersonal influence perspectives and had few ideas about how to operate as a leader in new team situations (i.e., no ideas, or transformational and initiating structure). By contrast, collective team leaders considered personal dominance, interpersonal influence and relational dialogue perspectives and appeared to apply a mix of team leadership styles to new situations (i.e., transformational, empowering and initiating structure). This contributes to Schyns et al. (2011) and Rupprecht et al. (2010) who suggested that the more team leaders are able to understand their situation, the more they are able to adjust their behavior effectively in that specific context.

Finally, this study provides new empirical and in-depth insights into the variety of team leader cognitions. Our exploration into team leader cognitions broadens the dominant behavioral team leadership approach (Day et al., 2009) and the leader-follower focus of leadership theories (Day et al., 2014). We connected leadership theories, cognitive and team leadership research and showed that team leaders who use different leadership perspectives also use and recognize team learning behavior, task features, interpersonal learning factors, and different styles of team leadership behavior that are found to be important drivers for team success.

LIMITATIONS AND FUTURE RESEARCH

The current study used different approaches to facilitate elicitation of team leader cognitions, which led to rich in-depth data. Future research can examinine whether team leader cognition can be diversified, and if so, what brought about this change. Following team leaders over time may identify certain turning points that trigger diversity in their cognition. In doing so, we suggest to study how cognition, behavior and specific context interplay in team leaders' minds and actions (e.g., Hodgkinson, 2003).

PRACTICAL IMPLICATIONS

Our findings provide directions for team leader training. Based on the detected variety between team leader cognitions, we recommended to start team leader training with an elicitation of their cognitions (e.g., Schyns et al. 2011). Moreover, the limited leadership perspectives and team factors of a majority of the team leaders in our sample bring to mind that team leader cognitions can be developed into more diversity. Lord and Hall (2005), for instance, argued that leaders develop from an individual, to relational, and then a collective view on leadership. More diversity may guide team leaders in adapting their behavior to specific team situations more adequately (Hooijberg et al., 1997; Rupprecht et al., 2010).

To conclude, we endorse the view that it is undesirable to train team leaders in adapting their behavior by immediately telling them what to do. By contrast, developing team leaders starts with increasing their awareness of and diversifying their team leader cognitions. We argue that solely focusing on the behavioral aspects of team leadership neglects leaders' own leadership perspectives and specific team situation and does not help team leaders improve their ability to make decisions about the situation a team is in or judge whether it is indeed necessary to make a change. We showed that team experiences, metaphors and cases are relevant cues to evoke team leader cognitions, which can serve as a starting point to support team leaders in viewing, interpreting and adapting their specific team situation more adequately.

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6 GENERAL DISCUSSION AND CONCLUSION

How can team leadership behavior support learning behavior in university teacher teams working towards educational change? This main research question was investigated in four studies. In the first study, we explored how university teacher teams established by an organization learned to deal with their team task. The second study presented a meta-analysis on when team leadership behavior supports team learning behavior. Our third study examined when different types of team leadership behavior support learning in university teacher teams responsible for educational change. Finally, in our fourth study we explored leadership perspectives and team factors in team leaders cognitions when viewing team situations.

What can be learned from the four studies (presented in chapters 2, 3, 4 and 5) to understand how team leadership behavior can support the learning behavior of university teacher teams? In this concluding chapter, we integrate and discuss the main findings organized by three key topics: leadership that supports team learning behavior, the specific team task matters, and how team leaders think differently. This chapter concludes by discussing limitations, recommendations for future research, and practical implications related to leadership for team learning. Finally, the main conclusion presents our take-home message.

LEADERSHIP THAT SUPPORTS TEAM LEARNING BEHAVIOR

This dissertation argues that university teacher teams need to engage in team learning behavior to work towards change in higher education. Across disciplines, research has shown that collective discourse activities such as sharing, discussing, and co-constructing knowledge allow teams to do so (Kozlowski & Ilgen, 2006; Van den Bossche, 2006). These team learning behaviors enable teams to build new knowledge and change routines because they reveal misconceptions, question the status quo, and modify what is previously known, in turn resulting in team performance (Edmondson, 1999; Kozlowski & Ilgen, 2006; Van den Bossche, 2006). Studies 1 and 3 showed that university teachers are able to engage in team learning behavior when working on team tasks. This finding provides new information on teacher teams in higher education (Gast, Schildkamp, & Van der Veen, 2017; Vangrieken, Dochy, Raes, & Kyndt, 2015). More specifically, the interview

analyses of Study 1 revealed that all teacher team members engaged in sharing ideas. Yet, the analyses also uncovered that only a minority of the teams engaged in sharing, co-construction, and constructive conflicts; despite the fact that they all experienced high levels of task interdependence, team psychological safety, and team efficacy. Vangrieken et al.'s (2015) review also detected that most teacher collaborative learning processes are superficial and limited to the sharing of ideas, and that deeper levels needed for change such as discussing ideas and questioning assumptions rarely occur. Correspondingly, the quantitative survey-data analyses of Study 3 showed that the learning behavior of university teacher teams varied.

We were not surprised to learn that university teacher teams do not automatically engage in team learning behavior (studies 1 and 3). Research in many professions has found that team learning behavior requires the support of team leadership behavior (Burke et al., 2006; Edmondson, Bohmer, & Pisano, 2001; Lee, Gillespie, Mann, & Wearing, 2010; McKeown, 2012). Other studies have also suggested the need for leadership support for university teacher teams to overcome team learning barriers such as traditional independence, conflict, and change-avoidance working behavior (e.g., Furco & Moely, 2012; Kezar, 2011). Studies 1, 2, and 3 confirm how important the role of team leadership behavior is for team learning behavior. These three studies are the first to our knowledge to relate different sources and styles of team leadership behavior to team learning behavior (Zaccaro, Ely, & Shuffler, 2008). Each of these three studies offers new insights into how leadership behavior supports team learning behavior.

Study 1 explored how university teacher team learning is supported by a combination of person-focused (transformational in Study 1) and task-focused (transactional in Study 1) team leadership behaviors. Bucic, Robinson, and Ramburuth (2010) detected the same in this same context, and we found that these styles can support team learning behavior whether they stem from vertical or shared team leadership sources. We integrated these different styles and sources into team learning behavior, and can offer new in-depth understandings that respond to calls for empirical specification of effective modern leadership in higher education (Bryman, 2007; Evans, Homer, & Rayner, 2013; Gast et al., 2017; Kezar & Holcombe, 2017; Van Ameijde, Nelson, Billsberry, & Van Meurs, 2009). The findings of Study 1 in particular contribute to the suggestion that leadership should strike a balance between providing structure and leaving room for creativity (Evans et al., 2013; Van Ameijde et al., 2009). The results reveal that team leaders should be aware of team processes and mainly be involved from a distance: intervening actively does not seem to help teams in moving beyond sharing ideas. Furthermore, Study 1 indicated that the most supportive shared team leadership behaviors for teams to jointly develop knowledge consisted of connecting team members by focusing on the team as a whole instead of letting them solve problems individually. It also

found that team members should not smooth out differences and merely check off their list of tasks. Instead, our findings show that they should discuss and integrate differences and content at a team level to support their engagement in team learning behavior aimed at achieving change. These findings further detail the more general shared leadership behaviors presented by Van Ameijde et al. (2009).

Our second study meta-analyzed the available empirical knowledge about the influence of different types of team leadership behavior on team learning behavior across disciplines. The results confirm the significance of the role of team leadership behavior in supporting team learning behavior and show that vertical person- and task-focused and shared team leadership behaviors are equally relevant. This is an important contribution because it relates vertical and shared leadership to team learning behavior, which adds to Nicolaides et al.'s (2014) meta-analysis that related vertical and shared team leadership behavior to team performance. In addition, Study 2 showed that person-focused styles mainly support team learning behavior by providing encouragement to seek alternatives (transformational) and stimulating cooperation (empowering). These stimulating team leadership behaviors have been studied extensively and have repeatedly shown this positive impact (Burke et al., 2006). However, Study 2 shifts this traditional emphasis on person-focused styles by revealing that task-focused team leadership behaviors are also important.

More specifically, team leaders who provide structure by defining team tasks, methods, and outcomes (i.e., initiating structure; Døving & Martìn-Rubio, 2013) can guide team learning behavior, for example to reflect on team tasks together (Somech, 2006). However, the qualitative studies included in our meta-analysis stressed that the team processes should not be overstructured (e.g., McKeown, 2012; Nouwen, Decuyper, & Put, 2012). Team members should feel that they are in control of the team goals, processes, and outcomes, such as deciding about the kind of design for the product that needs to be developed. Otherwise they sense that their contribution is not needed or not taken seriously, which lowers their trust in each other and their leader, and in turn their motivation for team learning behavior (e.g., McKeown, 2012; Nouwen et al., 2012). In addition, Study 2 showed that shared team leadership behavior also influences team learning behavior because the equal distribution of power and responsibilities among team members allows team members to interact, share information, and freely disclose unique expertise (e.g., Hoch, 2014). To conclude, these main findings contribute to the preliminary meta-analysis of Burke et al. (2006) on the influence of team leadership behavior on team learning behavior. Our meta-analysis showed that similar research has increased substantially in the past two decades. This new research allowed us to integrate multiple styles and sources of team leadership behavior, in contrast to the groundwork of Burke et al. (2006), which was only able to examine one team leadership type (i.e., vertical empowering team leadership behavior).

Our third study built on these key findings and examined the influence of transforming, empowering, and initiating structure from a vertical and shared source on the learning behavior of university teacher teams working towards educational change. The aim here was to discover which style is most beneficial. Study 3 showed that shared transformational team leadership behaviors were most supportive for the teams. The results reveal that challenging the status quo collaboratively and stimulating each other's intellect strongly supports team learning behavior. Interestingly, Study 3 emphasized that these shared transformational team leadership behaviors are far more important than initiating structure or empowering styles and the support of formal team leaders. It appears that university teacher team members mostly need each other's encouragement to take a chance on team learning behavior and to overcome their natural habits of avoiding change and working independently (e.g., Furco & Moely, 2012), which is in contrast to formal team leaders who encourage, empower, or structure this for them. This finding confirms the identified suitability of vertical team leadership behavior in studies 1 and 2: leaders who intervene actively or overstructure processes do not seem to help teams to engage in team learning behavior. Furthermore, this finding contributes to the emerging studies on shared leadership by specifying which kind of behaviors support team learning behavior most (Nicolaides et al., 2014; Van Ameijde et al., 2009). In addition, it provides innovative empirical information by relating different styles and sources of team leadership behavior to team learning behavior (Zaccaro et al., 2008).

In sum, team leaders across all professions can best support team learning behavior for working towards change by encouraging, empowering, and providing just enough structure (studies 1 and 2). Moreover, in the context of university teacher teams, we showed that members themselves can support their own team learning behavior by connecting members and issues at a team level and stimulating each other's intellect to seek alternatives and challenge the status quo to work towards educational change together (studies 1 and 3).

THE SPECIFIC TEAM TASK MATTERS

This dissertation reasons that teams need to engage in team learning behavior to deal with their task. A task can be defined by its level of interdependency (Johnson & Johnson, 2003), novelty (Hoegl, Parboteeah, & Gemuenden, 2003), structure (Ellström, 2001), and complexity (Cooke, Kiekel, & Helm, 2001; De Dreu & Weingart, 2003). We characterize team tasks with low levels of interdependence, novelty, and complexity and a high degree of structure as adaptive tasks that require team learning behavior to reinforce routines (Devine, 2002; Ellström, 2001). In contrast, team tasks that require team learning behavior to work towards innovation and change are characterized by a high level of interdependence, novelty, and

complexity and a low degree of structure. These are referred to as developmental tasks (Devine, 2002; Ellström, 2001). The results of studies 1, 2 and 3 show that this team task variation influences the relationship between team leadership behavior and team learning behavior. Each of these studies reveals that the team task determines which specific behavior is the most supportive type of leadership behavior for team learning behavior.

The university teacher teams in Study 1 who perceived their task to be highly structured (i.e., an adaptive task) limited their team learning behavior to merely sharing ideas. Their leaders actively intervened in team processes, and their members shared team leadership behaviors by addressing individual issues individually. These teams may have sensed that sharing ideas was enough to succeed because they knew how to approach a task based on standard methods (e.g., Ellström, 2001). As such, there was no urgency to integrate and co-construct new knowledge as a team. Accordingly, team leaders who actively structure processes might actually support teams in their processes of sustaining their existing knowledge (e.g., London, 2014). Furthermore, Study 1 suggested that addressing individual issues individually might be beneficial for learning for their task, since this shared team leadership behavior does not encourage team members to build upon what is shared. Team members do not seek to build either because of their task perception (Study 1). On the contrary, the university teacher teams in Study 1 who perceived their task as highly complex (i.e., a developmental task) moved beyond sharing and also engaged in co-constructions and constructive conflicts. Their leaders were aware of team processes but did not actively intervene, and their members shared team leadership behaviors that focused on the team as a whole and integrated individual issues at the team level. These teams indicated that standard methods and solutions were inadequate and they needed to create new knowledge together to succeed (e.g., Cooke et al., 2001; De Dreu and Weingart, 2003). As a consequence, they did not need leaders to structure processes, but they needed each other to use and integrate everyone's input at the team level. Day, Gronn, and Salas (2004) also claimed that a successful approach to developmental team tasks requires the input and integration of team members' expertise, and not just a top-down strategy to support team learning behavior.

Building on the findings of Study 1, the meta-analysis of Study 2 examined how team tasks moderate the influence of team leadership behavior on team learning behavior. The quantitative results showed that vertical, person-focused team leadership behaviors support team learning behavior for both adaptive and developmental tasks. In contrast to London (2014), who suggested that developmental tasks benefit most from person-focused leadership. Vertical task-focused team leadership behaviors were found to be highly supportive for learning in teams dealing with adaptive tasks. However, this leadership style was not significant for teams facing developmental tasks. This confirms London's (2014) suggestion that

task-focused leadership best supports learning for adaptive tasks. Our qualitative analyses added to this that – also for adaptive tasks – team leaders should not overstructure the team processes, but should include the influence of team members to motivate their team learning behavior (e.g., McKeown, 2012; Nouwen et al., 2012). These findings offer new knowledge that empirically confirms and specifies the suggestion that team tasks play an important role in considering which leadership behavior is most effective for team learning behavior (London, 2014).

Study 3 tested the findings of studies 1 and 2 in university teacher teams facing a developmental task. Each team shared the responsibility to develop educational change. However, not all teams experienced their task as being complex and these differences were found to influence the relationship between vertical empowering team leadership behavior and team learning behavior. Study 3 showed that formal team leaders who empowered teamwork were only important for team learning behavior if their teams perceived their task as not being complex. Due to this perception, these teams might not automatically recognize that they need to collaborate and interact because they sense that standard methods and solutions are enough to succeed (Cooke et al., 2001; De Dreu and Weingart, 2003). Consequently, the learning behavior of these teams needs to be fueled by leaders who empower them by encouraging teamwork, interaction, and the coordination of individual efforts at the team level because these teams do not recognize this themselves. Perhaps team members who perceive their task to be highly complex automatically recognize that they need to collaborate and do not need a team leader to tell them this. Study 1 similarly found that team members who experienced their task as being highly complex also discussed and integrated individual inputs at the team level. This is in contrast to team members who perceived their task to be predictable and kept individual issues at the individual level.

In sum, to determine which team leadership behavior is most beneficial in a particular context we should consider the team task and how it is perceived by the team members. Structuring behaviors best support team learning behavior for adaptive tasks (studies 1 and 2), but these structuring behaviors should not be too dominant and should leave enough space for the team to participate in processes and make their own decisions about goals and outcomes (Study 2). Encouraging behaviors support team learning behavior for both adaptive and developmental tasks (Study 2). More specifically, shared transformational team leadership behavior (Study 3) and jointly integrating expertise at the team level (Study 1) are the best approaches for supporting learning behavior in university teacher teams working towards change. Team leaders are only able to support the learning behavior of university teacher teams if the teams do not automatically recognize that they need to build new practices together. The best approach in these cases is to facilitate teamwork, interaction, and coordination (Study 3). Therefore, team leaders as well as team members can best shift between person- and task-focused

leadership styles depending on the specific team task (studies 2 and 3). This conclusion adds an empirical foundation to conceptualizations such as ambidextrous leadership (Tushman & O'Reilly, 1996) and suggestions to adapt the team leadership style to the specific team task to optimally support team learning behavior (Day, Harrison, & Halpin, 2009).

HOW TEAM LEADERS THINK DIFFERENTLY

The results of the first three studies indicate that team leaders should be aware that they can shift between different team leadership styles and team leadership behavior to support team learning behavior depending on the (perceived) team task. Study 4 explored team leader cognition to understand how team leaders use and recognize various team factors (i.e., team leadership behaviors, team learning behaviors, interpersonal learning factors and team task characteristics) when they view team situations. We also looked at whether they are aware of the different approaches (i.e., leadership perspectives) that can be used to influence teams. We selected leaders of teams that needed to bring about educational change.

The results of Study 4 indicate that team leader cognitions vary considerably. Almost all team leaders held personal dominance and interpersonal influence leadership perspectives. This means that a majority of the team leaders perceived leadership as a combination of a top-down influence from the leader to the team and a two-way influence between the leader and the team. However, only a minority also perceived leadership as a dynamic influencing process (relational dialogue) within the team. These team leaders appear to perceive leadership not only as a way to influence through interaction, but also as a way to distribute power to the team and use team member knowledge and ideas in processes and shared decision making. To our knowledge, these results offer new insights because the only leadership perspectives that we know of appear in leader-follower theories but not (yet) in team leadership theories (Day, Fleenor, Atwater, Sturm, & McKee, 2014). We applied a team approach to these leadership perspectives developed by Drath (2001) and empirically explored these.

Furthermore, Study 4 revealed that the diversity of team leader perspectives can also be found in the use of team factors. It appeared that team leaders with narrow leadership perspectives also consider fewer team factors in their cognitions. Similarly, team leaders that considered all three leadership perspectives also used and recognized a wide variety of team factors. More specifically, team leaders with a low cognitive diversity mainly viewed leadership as a top-down and two-way influence, and hardly used team learning behavior and interpersonal learning conditions when reflecting on team situations. These team leaders also had no or few ideas on how to behave in new team situations. This suggests that despite the fact they were able to detect several task characteristics, they were not able to use

that information. On the contrary, team leaders with a high cognitive diversity viewed leadership as a top-down, two-way and dynamic influence process, and used various team learning behaviors and interpersonal learning conditions. They also mentioned mixed team leadership styles that could purposefully be applied in new team situations. These findings suggest that a broad conceptualization on leadership and the ability to use and recognize various team factors may help team leaders to judge a team's specific situation and apply leadership behavior that is meaningful to that situation (Hooijberg, Hunt, & Dodge, 1997; Lord & Hall, 2005). This suggestion provides empirical support for Day and Harrison (2007), who reasoned that a traditional view on leadership is rather narrow, and is generally viewed as leadership with a top-down influence that does not consider the specific situation at hand. They argued that a collective leadership view is emerging to keep up with the increased complexity of current work environments. This view includes multi-level leadership influences (top-down, two-way, and dynamic) that fit the specific situation. Furthermore, Study 4 provides new empirical insights on team leader cognition that shift the dominant behavioral approach to study team leadership (Day et al., 2009).

In sum, the results of Study 4 indicate that team leaders do not necessarily hold a collective view on leadership and diverse team factors. Team leaders who do might be better able to interpret team situations, judge whether it is necessary to intervene, and decide which team leadership behavior is most meaningful, based on that higher variety of leadership perspectives and team factors in their cognition. For these reasons, we suggest that training for team leaders should start by making them aware of their cognitions, broaden their leadership perspectives, and increase their understanding of the specific situation in which they operate before jumping to conclusions about which team leadership behaviors are most effective (e.g., Schyns, Kiefer, Kerschreiter, & Tymon, 2011). Such training may improve their ability to adjust their behavior effectively to a specific situation (Mumford, Todd, Higgs, & McIntosh, 2017; Schyns et al., 2011).

Overall, our findings provide new answers on how team leadership behavior can support (university teacher) team learning behavior. We integrated team, leadership, and educational research and showed that different styles and sources can support team learning behavior. The team task determines which contributes most. This indicates that team leaders should be aware of the different influences of leadership on team learning behavior for specific team tasks.

LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

Where to go from here? Based on the key findings, concepts, and methods in this dissertation, we have three recommendations for future research to take the next

step in understanding how team leadership behavior can support team learning behavior.

First, we recommend further investigation into the influence of specific team tasks on team processes. This dissertation studied team task from the team perspective. We did not take the organizational level into account. In Study 1, we selected teams that needed team learning behavior to succeed in their task – as indicated by the faculty management and verified by the team members. Here we explored how the team members experienced the team task. The second study objectively divided the teams into teams working on either adaptive or developmental tasks, based on the sample descriptions of the included studies in the meta-analysis. Study 3 selected teams that needed to develop educational change – according to the faculty management and verified by the team leaders and members. Here we aggregated the task perceptions of the team leader and the team members into a score per team In Study 4, we explored whether team leaders used and recognized team task features in various team situations. These studies interpreted team task from a team level perspective. We recommend that future research also includes the organizational perspective of interpreting the team task and whether the experienced team task aligned with organizational goals. For instance, one third of the teams in Study 1 limited their team learning behavior to sharing ideas. They coordinated their knowledge but did not build new knowledge that contributes towards developing change. We do not know whether this is enough to reach organizational goals. From a team level perspective, these teams did not observe the need to move beyond their routines, so did not see why they should engage in more than sharing ideas. However, from an organizational perspective there might be an urgency to develop new courses to improve educational quality. In contrast, Study 1 also identified teams that sensed they needed to build new knowledge together. These teams might develop new practices that disrupt educational systems and have more impact on the organization than expected. In other words, teams may sense they need to change their education, but what if their organization does not support, recognize, or facilitate that change? Therefore, we recommend that future research includes an organizational perspective to answer this question. For example, research could address the question how team leaders can manage expectations back and forth, both at the team (e.g., Edmondson et al., 2001) and the organizational level (e.g., Wong, 2004), without overstructuring processes that hinder team learning behavior.

Second, we recommend to conduct longitudinal studies to take the next step in understanding on how the influence of team leadership behavior on team learning behavior for a certain team task can shift over time in terms of style and source. Our studies were cross-sectional and indicated that team leaders should shift between different leadership styles depending on the specific team task (studies 2 and 3). A longitudinal study by Lorinkova, Pearsall, and Sims (2012) showed that

the structuring behaviors of team leaders supported teams that faced a complex task in the early stages and that empowering behaviors are more important as the team processes evolve over time. Our third study showed that, in teams working towards change, team age was inversely related to a shared initiating structure, which implies that younger teams focus more on collaboratively structuring processes than older teams. Longitudinal designs can take the next step and specify which type of team leadership behavior is needed in which team phase – with respect to the specific team task – to increase understanding of how to support team learning behavior over time. For example, to support team learning behavior for developmental tasks, team leadership behavior may start by initiating structure to provoke a sense of urgency for team learning behavior. Subsequently, team leadership behavior may shift towards empowerment and encouragement for interaction and creativity. Towards the end, a team leader might need to initiate structure to ensure a task is completed. Following teams over time can increase understanding of how to provide just enough structure and just-in-time support for team learning behavior. This is especially true if research includes shared and vertical sources of team leadership behavior alongside multiple leadership styles. This is suggested to understand how team leaders can, for example, help team members engage in shared transformational team leadership behavior if this does not happen automatically.

Third, this dissertation offers many insights on various factors that help teams to engage in team learning behavior. Yet, Study 4 revealed that only a minority of the team leaders were aware of the diversity of leadership perspectives, types of team leadership behavior, team learning behavior, and tasks. We recommend examining whether team leader cognition can be diversified, and if so, what brought about this change. The question of whether leadership is born or made is discussed extensively in leadership literature (Day et al., 2014). Hooijberg et al. (1997) argued that leader cognition can develop from basic to complex leadership conceptualizations with a high cognitive diversity. However, it is unknown how the cognitions of team leaders evolve over time (Day et al., 2009). The methods used in Study 4 to elicit team leader cognition can serve as an example of how to map team leader cognition in the beginning and at the end of training to detect changes. Furthermore, following team leaders over time may identify certain turning points that trigger diversity in their cognition. Moreover, current leadership literature emphasizes that such training interventions should not only include leaders, but also teams. Day et al. (2014), for instance, emphasized this to support the dynamic process of leadership that occurs within teams and to expand the traditional focus that only considers the top-down influence of formal leaders. Similarly, this dissertation shows that not only the formal, but also shared team leadership behaviors are important for team learning behavior. As a consequence, we recommend that

future studies explore how teams and team leaders can be trained and how their cognitions can be diversified to optimally support team learning behavior.

IMPLICATIONS FOR PRACTICE

This dissertation argues that university teacher teams are able to work towards educational change through team learning behavior that is supported by team leadership behavior. We formulate four practical implications to utilize the potential of teams. These implications provide directions to answer the questions of the two team leaders in the example presented in the introduction:

(…) What started as a good idea did not automatically result in success. The teams had invested a great deal of time in solely sharing ideas without achieving any results towards the desired new educational courses. The two educational leaders wondered what they could do to help their teams engage in change and build a new educational program together.

This example illustrated a situation in which teams were implemented to offer ownership and enthusiasm for teachers to design new educational courses that fit their own practices. This approach allows teams to combine multiple inputs and perspectives and is in contrast to top-down approaches for educational change (Handelzalts, 2009). However, the team leaders in the example observed that the teams did not meet their expectations and they struggled to help the teams move beyond their routines. What are our suggestions for them?

The first implication for practice derived from this dissertation is that it is not enough to simply install teams with the aim of bringing about educational change and simply waiting for that magic to happen. University teacher teams do not naturally engage in team learning behavior. They need to recognize that their current practices are no longer adequate, and that they need each other's input to co-construct new ideas. If they only exchange ideas, they will reinforce what is already known without developing new knowledge together. An exchange of ideas may be sufficient for adaptive tasks, but teams need to move beyond sharing ideas if they are to develop new practices. This means questioning assumptions, seeking alternatives, discussing conflicting ideas, and integrating differences, and subsequently creating new knowledge. However, this dissertation shows that teams do not do this automatically. For example, Study 1 indicated that university teacher teams have a tendency to avoid change and iron out differences. This indicates that teams need support to engage in change.

The second implication, as shown in studies 1, 2, and 3, is that team leadership behavior is a key driver for team learning behavior. Support for team learning behavior can be provided in different ways. This can range from focusing on

individuals by building trust and relations and empowering and challenging team members, to focusing on tasks by defining and monitoring team tasks, methods, and goals. These behaviors can be exhibited by a single leader and by team members themselves. However, our findings revealed that simply supporting teams to engage in team learning behavior to work towards change does not mean team leaders have paved the way for teams. In fact, if team leaders overstructure processes and are too actively involved, team learning behavior is obstructed. This is because the overstructuring minimizes members' influence, expertise, and ideas, which in turn does not support interaction and collaboration. Instead, we advise team leaders to provide space and safety to team members and include and integrate team member influence and expertise.

The third implication is that the choice of which specific leadership type to use to optimally support team learning behavior should be influenced by the perceived team task. For adaptive tasks, team leaders can focus on the team members and the task. For developmental tasks, team leaders should mainly focus on the team members through consideration, empowering, and transformational behaviors, and not restrain teams from learning by emphasizing their tasks. Moreover, for developmental tasks in higher education, it is the team members themselves and not an actively involved team leader who should challenge their intellect, question the status quo, and seek alternatives.

But are team members aware that they themselves are the key to their team developing change together, or would they rather wait for instructions from formal leaders? Study 3 showed that if teams do not automatically recognize they should engage in change together, team leaders should empower them. This means encouraging teamwork, interaction, and the coordination of individual efforts at a team level to support team learning behavior that otherwise would not occur. Therefore, we recommend that team members and team leaders are aware of each other's task perception. Discussing and specifying the team task together can help to choose which team leadership behavior would be most supportive for their learning behavior to deal with that task. Vertical and shared team leadership behaviors can fuel this process by challenging examples (transformational), setting the right atmosphere to seek controversy (consideration), and empowering team members to see the added value of the team and unique knowledge of the members.

The fourth implication for practice is that team leaders should be aware of how they think about leadership and interpret their specific team situation. Building on Study 4, it is likely that their cognitions can be further broadened by developing their knowledge on different team leadership perspectives, team leadership behaviors, team learning behaviors, and the role of the team task. We argue that such higher cognitive diversity may help adapt their behavior to specific team situations more adequately (e.g., Hooijberg et al., 1997). To be clear, this does not mean

telling team leaders what to do. If team leaders perceive leadership as a top-down influence, they may not immediately understand if they are told that shared transformational leadership behavior is the best option for supporting team learning behavior for educational change. Solely focusing on the behavioral aspects of team leadership neglects their own leadership perspectives and specific team situation. This may not help them make decisions about the team situation or judge whether change is needed. Study 4 showed that team experiences, metaphors, and cases are relevant cues to evoke team leader cognitions, which can serve as a starting point to support teams in viewing, interpreting, and adapting their specific team situation more adequately. Including both team leaders and team members in creating awareness about how they think about leadership and their specific team situation might help them reflect not only on the vertical but also on the shared source of team leadership behavior to support team learning behavior in service of the task.

In sum, we advise teams and their leaders to (1) not assume that learning behavior automatically takes place, but to (2) provide support and just enough direction for team members to engage in change, and (3) choose a style that respects the task perception, and (4) discuss leadership perspectives and specific team situation together to move forward.

LEADERSHIP FOR TEAM LEARNING: A CONCLUSION

The studies presented in this dissertation were conducted to understand how team leadership behavior can support the learning behavior of university teacher teams working towards educational change. The findings indicate that various styles of team leadership behavior from vertical and shared sources can support team learning behavior. This support is needed for team learning behavior which otherwise would not occur or would be only superficial and limited to merely sharing and sustaining practices. When choosing the specific team leadership type, the team task should be taken into consideration. Is there an urgency to develop new practices, or are current practices still adequate? It is sufficient for the team leader to be actively involved and structure the task for the latter. However, developing new practices requires team leaders who provide space and encouragement. This is needed to engage team members in change and to challenge each other to seek controversy and integrate new perspectives. Providing such support that respects the team task requires team leaders who include and integrate team members' influence and expertise. We argue that teams are not supported to engaging in change by a 'top-down one size fits all strategy' for team learning behavior regardless of what actually happens in the teams. In contrast, this dissertation shows that team leaders should be aware of the specific team situation and based on

that context choose a leadership style that will provide meaningful support for team learning behavior.

In addition, we showed that team members themselves who encourage each other's intellect in seeking alternatives and challenge the status quo support their team learning behavior for working towards change. However, our findings also indicate that university teachers do not necessarily sense that they need to bring about new practices together. It is likely that these teams will sustain their standard methods without questioning them. This results in an absence of comparing practices to new discoveries in their domains, integrating emerging different perspectives, and building new knowledge together. As such, these teams will not work towards new educational practices and, therefore, run a risk. Today's professional organizations, such as higher educational institutions, are faced with complex challenges to keep their added value to society. We argue that these organizations will not be able to address these challenges if their teams do not question the adequacy of current practices. Our results show that based on how teams perceive their task, a specific style and source of team leadership behavior should be chosen to optimally support team learning behavior. More specifically, we showed that team leaders can empower learning behavior in teams that do not automatically recognize they need to bring about change. In doing so, we suggest that team leaders and members discuss their specific team situation and leadership perspectives together. Subsequently, moving teams forward from routines towards engaging in change is a shared responsibility of both team leaders and team members. In the end, we are all learners contributing to higher education.

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VALORIZATION ADDENDUM

SOCIAL RELEVANCE

The findings of the studies presented in this dissertation can facilitate higher educational institutions in providing meaningful support for teacher teams. In 2016, the national council for education advised the Dutch government to stimulate and facilitate more teacher teamwork and the quality of that teamwork (Onderwijsraad, 2016). Their report reasoned that a team approach is needed to provide teachers with ownership of their work, which facilitates solving complex problems, such as those involved in bringing about educational change. At the same time, they concluded that the current support given to enable and improve teamwork is inadequate. It appears that leadership in educational institutes is mainly focused on supporting individual teachers and not teacher teams. Furthermore, the sources of leadership seem restricted to vertical leadership rather than a combination of vertical and shared leadership sources (Onderwijsraad, 2016). Even more recently, Van Middelkoop, Portielje, and Horssenberg (2018) discussed the trend in higher educational institutions to establish teacher teams as a new formal working structure without considering the organizational consequences and adequate support of those teams. Subsequently, they concluded that teachers still operate as individuals despite new formal team structures. These examples illustrate that it is not enough to bring teachers together in teams and wait for educational change to happen. Teacher teams need to be adequately supported to be effective. The purpose of the research in this dissertation addresses this matter, which offers many valorization opportunities.

The aim of the studies in this dissertation was to understand how team leadership behavior can support the learning behavior of university teacher teams working towards educational change. The results of our studies can facilitate higher educational institutions in providing meaningful support for teacher teams. As such, in addition to the scientific relevance, our empirical results are meaningful for society and educational practice. This valorization addendum discusses the transfer of our findings into past valorization activities that took place as part of this PhD project, present valorization activities, and future valorization opportunities.

PAST VALORIZATION ACTIVITIES

The topic of this PhD project emerged from practice as described in the introduction:

(…) The two educational leaders wondered what they could do to help their teams engage in change and build a new educational program together.

During the PhD project, this question appeared to be relevant to teachers, teams, educational advisors, policy makers, boards, managers, and team leaders. Various presentations, workshops, round tables, and advising activities were held that were informed by the studies in this dissertation. These activities were based on questions from practice and the target groups. An example of these activities is advice given to boards of professional schools implementing a team approach to work. This involved guidance given to a management team of a professional bachelor's program in several sessions during the preparation and implementation phase. We discussed ways to structure leadership styles and sources in the teams, team purposes, team composition, team processes, and teacher reactions during the transition phase. The conceptual models, findings, and knowledge that arose from this PhD project served as a language tool to describe, understand, deepen, and reflect upon practices and develop new questions. Furthermore, the counselling activities contributed to new policy statements and advisory reports.

In symposia on teacher collaboration we discussed the theory and preliminary findings of our studies with teachers, team leaders, scholars, and policy makers in workshops and round table sessions. Furthermore, tailored workshops were given to teams on how to improve their team work. These focused on hindering and fostering conditions for teamwork and the role of shared team leadership. Similar workshops were provided for team leaders and directors on how to provide meaningful support for their teacher teams. Another activity was the development and implementation of a training program for policy makers and educational advisors on effective teamwork and leadership in a higher educational institute, which contributed to a new work approach. In addition, the findings (mostly on team leader cognition) and methods (analyzing interviews) of the studies in this dissertation were shared in several workshops for postgraduate education.

Moreover, studies 1, 3, and 4 can be considered valorization activities in themselves. In Study 1, interviews were conducted with 16 teacher team members. At the end of each interview, the participants reflected on the added value of simply taking time to talk about their team. They mentioned that it made them more aware of the processes, their tasks, and the leadership in their teams. Most of the team members said they aimed to share and discuss their growing awareness with their teams. Each participant received a summary of their interview to facilitate that transfer. In Study 3, we collected survey data from 61 teams. After data analyses,

each team received an overview of their results with an explanation and practical interpretation, for which we developed a practical format. Many teams found this information very useful and it inspired their team reflexivity. In Study 4, we interviewed 15 team leaders. After the interviews, most team leaders indicated that thinking about and describing a metaphor made them more aware of their own view on team leadership. They were very willing to reflect on the observations their team made on their team leadership. Many team leaders mentioned that this made them more aware of their own role and impact on the team. They received a summary of the interview and appreciated this structured overview of their own perceptions. Given the participants' reactions, we assume the interviews, surveys, and tailored summaries contribute to the valorization of our research.

PRESENT VALORIZATION ACTIVITIES

Currently, the findings of the studies in this dissertation serve as a knowledge source in a large innovation program that aims to increase study success of undergraduates in a higher educational institute. This program involves several coaches supporting teacher teams, team leaders, directors, and boards on the job, with a focus on team work and leadership. Undergraduates are also involved in this program to help detect hindering and fostering factors for study success and provide advice in the design of advanced educational solutions. Also the professional field is involved as consultants to ensure alignment between their demands and the bachelor's programs and their assessments. Today, this innovation program covers 20 different professional bachelor's tracks. Again, the concepts, findings, and knowledge that arose from this PhD project serve as language tools to describe, understand, deepen, and reflect upon practices and develop new questions. Examples of this are that (1) team leaders are supported to ensure teacher teams have the opportunity to engage in shared team leadership behavior; (2) teacher teams are challenged to describe the need to collaborate and to define their team task; and (3) curriculum designers are encouraged to involve teachers in teams to develop new courses. Current coaches and new coaches follow a training program that was developed based on the findings in this dissertation, such as the benefits of utilizing shared team leadership behavior. Key and common professional development questions from teachers, team leaders, and curriculum designers that arise from the advising and training activities in this innovation program are currently collected, elaborated on, and translated into formal learning activities, in collaboration with the HR department. One of the collected subjects is about improving teacher team work and team leadership.

In addition, two chapters are being prepared in two upcoming handbooks that follow on from this dissertation. One chapter is an entry on leadership style in a forthcoming encyclopedia on higher education. Target groups for this

encyclopedia are advanced undergraduates and first-year graduate students. The other chapter is part of a forthcoming book on workplace learning. This chapter covers team learning and will be written in collaboration. The target group for this chapter are advanced undergraduates, graduates, and PhD students as well as practitioners and scholars who are not familiar with research on team learning.

FUTURE VALORIZATION OPPORTUNITIES

The fourth study in this dissertation (chapter 5) serves as a starting point for future research and valorization activities. The applied elicitation techniques covered in Study 4 offered insights into team leader cognitions. The findings indicated that team leader cognitions vary substantially. It appeared that team leaders do not necessarily hold a collective view on leadership (i.e., they hold various leadership perspectives) or diverse team factors (e.g., they use and recognize diverse team learning and leadership behaviors). However, this dissertation argues that team leaders who do hold a collective view are more able to interpret team situations, judge whether intervention is needed, and decide which team leadership behavior are most meaningful, based on the higher variety of leadership perspectives and team factors in their cognition. Future research and valorization activities are planned around designing development programs for teams and team leaders. Informed by Study 4, these programs should start by making team leaders aware of their cognitions, broadening their leadership perspectives, and increasing their understanding of their team's specific situation before focusing on effective team leadership behaviors. Research should accompany the design of these programs. The intention is to conduct longitudinal studies that (1) map team leader cognitions, (2) repeat that measure over time, (3) analyze if and to what extent the team leader cognitions have changed, and (4) interview team leaders on critical incidents that have occurred in the meantime. Based on those results, experimental studies could facilitate professional development interventions and test the extent to which they help team leaders to better adjust their behavior to specific situations. Another aim is to include teams in these interventions as well. Funding is currently being sought for these intentions. Moreover, the intended future research and valorization activities align with the newly proposed strategies of higher educational institutions to increase teacher team work and team leadership quality. This trend offers specific opportunities for practice to directly benefit from research and vice versa.

CONCLUSION

The main research question of this dissertation emerged from practice: how can team leadership behavior support learning behavior in university teacher teams working towards educational change? During the PhD project, this question appeared to be continuously relevant to teachers, teams, educational advisors, policy makers, boards, managers, team leaders, and HR departments. The conceptual models, methodology, and findings of the studies in this dissertation offered a rich source for many different workshops, presentations, round table sessions, advising activities, new approaches and policies, training programs, and reports. These valorization activities offer abundant examples of how to stimulate and facilitate teacher teamwork and its quality, as urged by the Dutch council for education (Onderwijsraad, 2016). The various valorization activities may also fuel awareness within higher educational institutions that effective teacher team work needs adequate support to prevent teachers from operating as individuals and teams only being established as a formal team structure (e.g., Van Middelkoop et al., 2018). Without adequate support, teams are merely a technical intervention that does not contribute to actual educational change.

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SUMMARY

As in many professions, university teachers increasingly work in teams to deal with complex issues, such as developing new educational programs. A team approach to work enables professionals to share, discuss, and integrate their knowledge at the team level. These processes are called team learning behaviors and they help teams develop new solutions. Most professionals do not naturally engage in team learning behavior. This is also true for university teachers. They tend to restrict collaboration to superficial interactions to avoid the risk of disagreement and conflict. Furthermore, teachers do not necessarily sense an urgency to develop new educational solutions as a team.

One of the most promising factors for supporting engagement in team learning behavior is team leadership behavior, since it can support and structure processes in teams. Team leadership behavior can be person-focused, such as stimulating interactions, or task-focused, such as prescribing the work that needs to be done. These styles can stem from a single, formally appointed team leader (the vertical source), as well as being distributed among multiple team members (the shared source). However, it remains unclear how team learning behavior is supported by team leadership behavior. Research rarely integrates multiple styles and sources of leadership behavior with team learning behavior, and neglects the role of the specific team task in those relationships. Team tasks can range from tasks with a low novelty and high level of structure (i.e., adaptive tasks) to tasks with a high novelty and low structure (developmental tasks) and may require different team leadership behaviors. Moreover, teams in the context of (higher) education are largely understudied.

With the use of four studies, this dissertation investigates how team leadership behavior can support the learning behavior of university teacher teams to work towards educational change. In the first study, we explore how team leadership behavior, team tasks, and team learning behavior are experienced by university teacher team members. The second study further specifies the findings of Study 1 by a multi-disciplinary meta-analysis on the influence of team leadership behavior on team learning behavior with respect to the team task. The third study examines which of the types of team leadership behavior derived from Study 2 support team learning behavior best in university teacher teams working towards educational change, and tests how team tasks moderate these relationships. The fourth study explores whether team leaders recognize and use different leadership perspectives and team factors when viewing team situations.

Our findings indicate that vertical and shared sources of team leadership behavior are relevant for supporting team learning behavior (Study 2). Team task is

found to influence the relationship between team leadership behavior and team learning behavior (studies 1, 2, and 3). Studies 1 and 2 showed that task-focused behaviors best support team learning behavior for adaptive tasks, whereas person-focused behaviors best support team learning behavior for both adaptive and developmental tasks. Specifically, jointly challenging the status quo (Study 3) and integrating expertise at the team level (Study 1) best supported learning behavior in university teacher teams working towards change. Study 3 showed that team leaders should only empower teamwork to support team learning behavior if teams do not automatically recognize that they are working on a developmental task. Accordingly, to support team learning behavior meaningfully, team leaders should be aware that they can shift between different styles and sources of team leadership behavior depending on the team task. Study 4 revealed that a minority of the team leaders used and recognized such a variety on leadership perspectives and team factors. This variety may support team leaders in interpreting team situations and deciding which team leadership behavior is most meaningful.

To conclude, our findings provide new answers on how team leadership behavior can support (university teacher) team learning behavior. We showed that different styles and sources can support team learning behavior. The team task determines which contributes most. Our results indicate that team leaders as well as team members should be aware that they can shift between different leadership styles depending on the specific team task. In the end, engaging in change is a shared responsibility of both team leaders and team members.

SAMENVATTING

Evenals andere professionals werken ook docenten in het hoger onderwijs steeds vaker in teams. Teamwerk stelt docenten in staat om te werken aan complexe vraagstukken, zoals het ontwikkelen van vernieuwende onderwijsprogramma's. In teamverband kunnen professionals hun kennis delen, bediscussiëren en integreren. Deze processen worden gedefinieerd als teamleergedrag, waardoor teams tot nieuwe oplossingen kunnen komen. Het vertonen van teamleergedrag is niet vanzelfsprekend. Ook docenten in het hoger onderwijs hebben de neiging om samenwerking te beperken tot oppervlakkige interacties. Dit gebeurt deels om meningsverschillen en conflicten te vermijden, daarnaast voelen docenten niet altijd de urgentie om nieuw onderwijs te ontwikkelen in teamverband.

Eén van de meest veelbelovende factoren in het stimuleren en structureren van teamleergedrag is teamleiderschapsgedrag. Teamleiderschapsgedrag kan gericht zijn op de personen, zoals het stimuleren van interactie, of gericht zijn op de taak, zoals het beschrijven wat gedaan moet worden. Teamleiderschapsgedrag kan worden vertoond door een formele teamleider (verticaal leiderschap), alsook door de teamleden zelf (gedeeld leiderschap). Het is echter niet duidelijk hoe teamleiderschapsgedrag nu precies teamleergedrag ondersteunt. Onderzoek integreert namelijk zelden meerdere leiderschapsstijlen in relatie tot teamleergedrag en negeert de rol van de specifieke teamtaak hierbij. Teamtaken kunnen variëren van routinematig en gestructureerd (adaptieve taak) tot innovatief en ongestructureerd (vernieuwende taak) en die taken vragen vermoedelijk verschillend teamleiderschapsgedrag. Bovendien wordt er nauwelijks onderzoek gedaan naar teams in het (hoger) onderwijs.

Aan de hand van vier studies onderzoekt deze dissertatie hoe teamleiderschapsgedrag het leergedrag van docenten in teams die werken aan onderwijsvernieuwing kan ondersteunen. In Studie 1 exploreren we hoe leden van verschillende docententeams het leiderschapsgedrag, de taak en het leergedrag in hun team ervaren. Studie 2 specificeert de bevindingen van Studie 1 middels een multidisciplinaire meta-analyse naar de invloed van teamleiderschapsgedrag op teamleergedrag, afhankelijk van de teamtaak. Studie 3 toetst welk(e) type(n) teamleiderschapsgedrag gevonden in Studie 2 het teamleergedrag van docenten die werken aan onderwijsvernieuwing ondersteunt. Ook test Studie 3 hoe de teamtaak deze relaties modereert. Studie 4 exploreert in hoeverre teamleiders verschillende leiderschapsperspectieven en teamfactoren herkennen en gebruiken wanneer zij teamsituaties interpreteren.

Onze bevindingen laten zien dat zowel verticaal als gedeeld leiderschapsgedrag relevant is voor het ondersteunen van teamleergedrag (Studie 2). De teamtaak blijkt de relatie tussen teamleiderschapsgedrag en teamleergedrag te beïnvloeden (Studies 1, 2 en 3). Studies 1 en 2 tonen aan dat taakgericht teamleiderschapsgedrag

het teamleergedrag het best ondersteunt voor adaptieve taken, terwijl persoonsgericht teamleiderschapsgedrag het teamleergedrag voor zowel adaptieve als vernieuwende taken ondersteunt. Meer specifiek: het teamleergedrag van docenten die werken aan onderwijsvernieuwing wordt voornamelijk ondersteund door gezamenlijk de status quo ter discussie te stellen (Studie 3) en gezamenlijk expertise te integreren op teamniveau (Studie 1). Studie 3 toont aan dat het bevorderen van teamwerk door verticaal teamleiderschapsgedrag alleen het teamleergedrag ondersteunt als teams niet uit zichzelf herkennen dat ze een vernieuwingstaak hebben. Om teamleergedrag betekenisvol te ondersteunen zouden teamleiders zich daarom bewust moeten zijn dat zij hun teamleiderschapsgedrag kunnen variëren al naar gelang de specifieke teamtaak. Studie 4 onthult dat slechts een minderheid van de teamleiders verschillende leiderschapsperspectieven en teamfactoren herkent en gebruikt, hoewel een dergelijke variëteit hen zou kunnen helpen in het interpreteren van teamsituaties en bij de keuze van het teamleiderschapsgedrag dat het meest effectief zou zijn.

Tot slot, onze bevindingen bieden nieuwe antwoorden op hoe teamleiderschapsgedrag het leergedrag van docenten in teams die werken aan onderwijsvernieuwing kan ondersteunen. Het blijkt dat verschillende teamleiderschapsstijlen relevant zijn. De teamtaak bepaalt welke stijl het meest bijdraagt. Onze resultaten geven aan dat zowel teamleiders als teamleden zich ervan bewust zouden moeten zijn dat zij hun teamleiderschapsgedrag kunnen variëren al naar gelang de specifieke teamtaak. Werken aan verandering is tenslotte een gedeelde verantwoordelijkheid van zowel teamleiders als teamleden.

ABOUT THE AUTHOR

Mieke Koeslag-Kreunen's professional and academic career is driven by her ongoing interest in challenging students, professionals, and herself to achieve aspirations through action, learning, and professional development. She started her professional career as a primary school teacher (Bachelor's degree in 2002, Saxion University of Applied Sciences, Deventer, in the Netherlands). In 2005, she obtained her Master's degree in Educational Sciences at the Faculty of Pedagogical and Educational Sciences at Radboud University Nijmegen, in the Netherlands. From 2004 to 2017 she worked at the Department of Education in Primary Schools at de Nieuwste Pabo in Maastricht, Heerlen, and Sittard, in the Netherlands. During this period, Mieke had various roles, including: a (senior) lecturer in learning psychology, didactics, and pedagogy; supervisor; assessor; and a project leader for accreditations. From 2008 to 2014 she headed the curriculum committee and was responsible for educational quality, development and innovation. Since 2017, she has held a part-time position as senior lecturer at Zuyd University of Applied Sciences, where she works as a coach, trainer, and supervisor for educational advisors, teacher teams, and team leaders with the aim of increasing student study success.

Mieke started her academic career in 2010 as a part-time junior researcher at the Research Department for Educational Innovation and Continuous Professional Development at Zuyd University of Applied Sciences. She worked in projects such as the future-proofing of technical vocational education in Limburg that was funded by a national platform for vocational education (HPBO). Mieke began her part-time PhD program in 2012 as an external PhD candidate at the Educational Research Department of the School of Business and Economics at Maastricht University, in the Netherlands. She obtained partial funding for this project from the Network for Social Innovation. Since 2018, Mieke has held a part-time position as a senior researcher at the Research Department for Educational Innovation and Continuous Professional Development at Zuyd University of Applied Sciences where she conducts research and consults educational institutions on curriculum design, learning and development, leadership, and team work.

LIST OF PUBLICATIONS

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As in many professions, university teachers increasingly work in teams to deal with complex issues, such as developing new educational programs. A team approach enables professionals to share, discuss, and integrate their knowledge at the team level. These processes are called team learning behaviors and they help teams develop new solutions. Most professionals do not naturally engage in team learning behavior. This is also true for university teachers, who tend to restrict collaboration to superficial interactions and do not necessarily sense an urgency to develop new solutions as a team. The studies presented in this dissertation investigate how team leadership behavior can support the learning behavior of university teacher teams to work towards educational change. The findings indicate that different styles and sources of team leadership behavior can be supportive. The team task determines which contributes most. It appears that team members who are aware they need to bring about change also encourage each other's intellect to seek alternatives. Teams who think that sustaining the status quo is enough are at risk and need empowering support from team leaders to help them move forward. This dissertation shows that engaging in change is a shared responsibility of both team leaders and team members. In the end, we are all learners contributing to higher education.